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New Knitting Machines.

The art of knitting is one of the most useful inventions, because it is really the only method by which textile goods of a truly elastic character can be manufactured. In connection with a description of the beautiful and improved knitting machines which illustrate this article, we will give a brief history of the rise of the art.

Superficial orators and authors often speak and write of this art as if it were as ancient as father Noah himself; but there is no substantial evidence of it having been known or practiced prior to the early part of the sixteenth century. Savery, a French author, states that about that time it was invented in Scotland, thence introduced into France, from which country it soon spread over all Europe. Its utility was at once appreciated, and it was not only eagerly learned by the female peasantry of the cottage, but high-born dames, in castles and courts, met together and knit their husbands' hose, while they chatted over the news of the day, each furnishing her quota of information to the charming circle, in the absence of newspapers.

Prior to the invention of knitting by hand, all stockings and hose were made of milled cloth; but these were soon discarded after the new fabrics appeared. The natives of the Shetland Isles, with the fine wool which they have at command, knit some very beautiful and fine hose; and it is a matter of history, that one of the girls of that northern country had once knit a pair so fine that they were drawn through her finger-ring, and afterwards presented to George the Fourth, who displayed them at his levees.

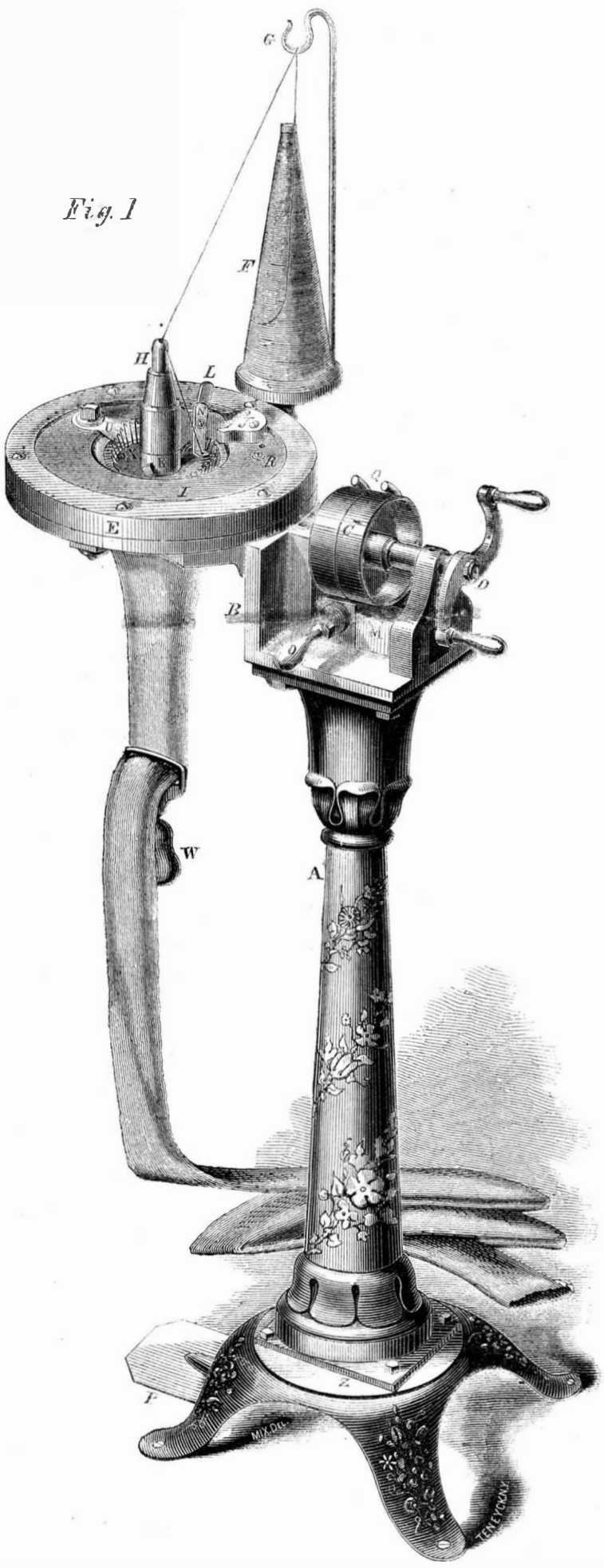
The first machine for knitting stockings of which we have any record, was invented by William Lea, of Woodborough, England, and its origin is founded on a romantic love affair. While a student in Cambridge he fell in love with a pretty girl, and being of an ardent temperament, he married her, in contravention of the statutes of the University, and for this cause was expelled by the hard-hearted old professors, who knew all about Latin and Greek and but little about an inventor's love. The prospects of William Lea's advancement in the Church were now cut off, and being poor, it is stated that he was supported by his young wife, who was a most skillful knitter of stockings. One evening, while musing sadly at seeing his young wife working late by the solitary lamp, it occurred to him that iron fingers might be made to do the work imposed on her for him, and that quite a number of loops could be made almost in an instant. He at once devoted himself to the construction of such a machine, and success soon crowned his efforts in the production of what is called "the old stocking frame," which was used for two centuries just about in the same condition as he left it. He exhibited his knitting-loom before Queen Elizabeth, but that haughty dame refused him a patent, on the ground that his invention would deprive the poor hand-knitters of employment—a stupid notion not yet entirely eradicated from society. Lea, however, was not dismayed at this result, as we read that he had no less than nine knitting-looms in operation in 1597, and that it was esteemed a high honor by every man who was employed by him, inasmuch as each wore a silver needle, ornamented with a chain and clasp, for a breast-pin.

That enterprizing monarch, Henry the Fourth, of France, having heard of Lea's invention, and how he was so ill-treated both by Queen Bess and her successor, King Jamie, invited him to that country, with all his machines and workmen, and Lea soon commenced the business at Rouen, in Normandy. Everything at first promised success to his undertaking, but the king, his patron, having been assassinated by a bigoted monk, he was soon proscribed on account of his religion, and having been compelled to flee for his life, sought refuge in Paris, where he soon afterward died in great poverty. Such is the brief history of the inventor of the first knitting machine who was a benefactor to the human race. His frame made plain knit fabrics only In 1756 Jediah Strut, of Derby, England, invented the machine for making ribbed hosiery, and by enlarging it Guernsey frocks and undershirts were also made. All these were knit with selvages, which had to be closed by hand in forming the seams. The round or circular knitting machine is said to have been first invented in France.

We have not been able to ascertain when the first knitting-frames were introduced into our country, but it is claimed that water and steam-power instead of hand-power were first applied here to operate them, and that the improvements which have been called forth to adapt them for such power, have made the American machines the best in the world.

AIKEN'S KNITTING MACHINE.

Fig. 1



The two represented by the accompanying figures are the result of five years' study and experiment, and no expense has been spared in bringing them to a state of the greatest perfection and simplicity. They are what are called "self-acting," and the latch-needle invented by James Hibbard, from whom the patent has been purchased, is employed in them, and no less than four other patents of recent dates are embraced in various parts and movements in them. Fig. 1 is a circular machine for knitting ribbed hosiery, cuffs for shirts, and bands for drawers. A is the stand, or pillar which supports the machinery on cap B; its base is bolted to the foot-piece Z. There is a fast and loose pulley, C, on the small shaft, D. A bifurcated shipper, Q, moves the belt from the fast to the loose pulley to stop the machine when a certain length of hosiery, S, is knit; when the weight, W, which feeds off the knit fabric reaches the treddle, P, it bears it down, and a rod inside the pillar, connected with a spring, then moves the shipper, and directs the belt on the loose pulley, when the machine stops. After the weight, W, is again moved upward on S, the belt is placed on the fast pulley by the hand-lever, O, in catch, M, and the knitting again proceeds.

K is a metal cone connected to the ring-plate, I, by a bent arm, J. The plate, I, is revolved by having a ring-gear on its under side, matching with a pinion on the inner end of driving-shaft, D. There is a cam groove

[Continued on page 328.]

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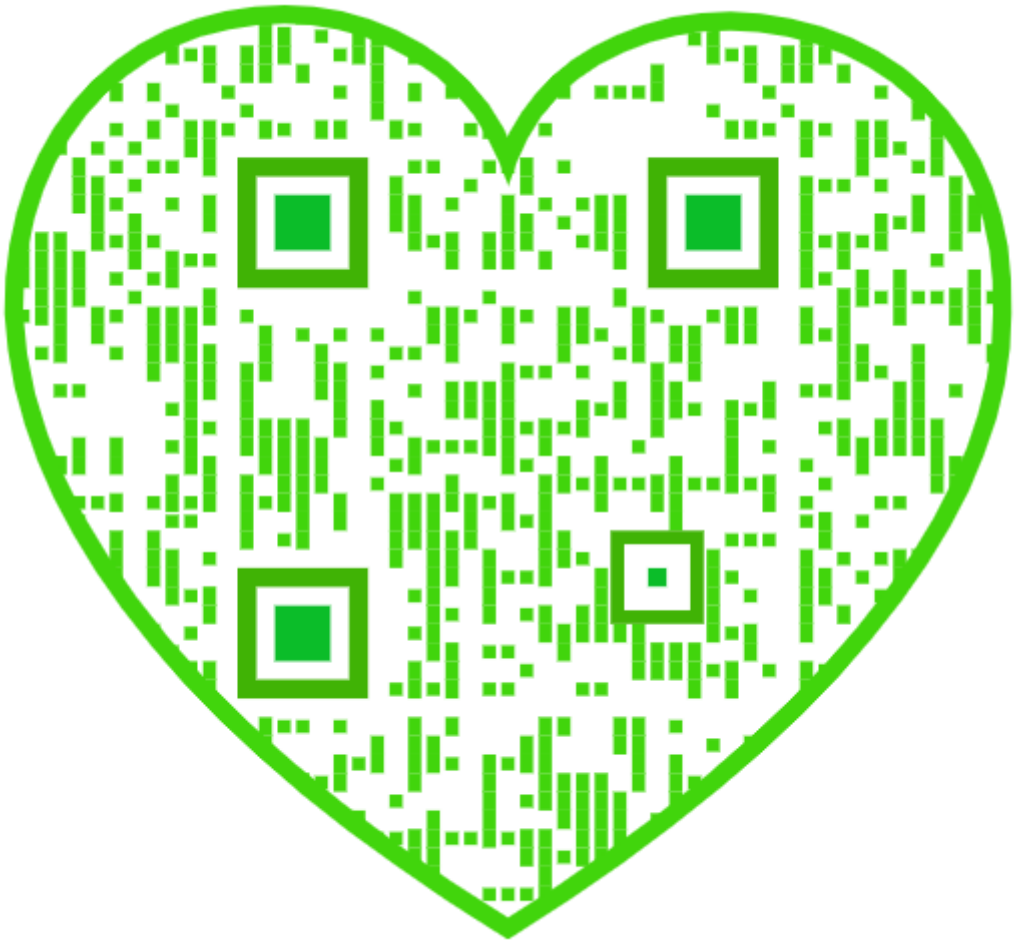

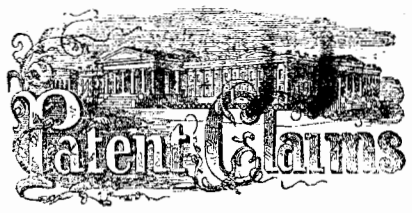

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SHOE FOR GRAIN SEPARATORS—Hiram Aldridge, of Michigan City, Ind. : I claim the endless incline elevator belt, C C, with its lags or cross slats, J, in combination with the incline sleve, or board, F, and incline extension board, R, arranged in the manner and for the purpose set forth.

BEDSTEAD FASTENING—G. W. Baker, of Cochranton, Pa. : I claim the box, E, the hook, D, and the rack, F, when the same are used and combined, substantially in the manner described and for the purpose set forth.

SMUT MACHINES—E. Barnhart, of Shippensburg, Pa. : I claim the disk, D, arranged with the fluted shell, E, and with the wings, C, to operate in combination with the fluted cylinder, F, which is provided with a spout, e, substantially as and for the purpose specified.

[This invention consists in arranging in a hollow cylinder with fluted top and sides a rotary disk, the surface of which is also fluted, and to which a cylindrical fluted shell is attached, which surrounds four wings placed at the underside of the disk, so that the wheat or grain as it passes through the funnel on the disk is spread in all directions. The grain is then exposed to the blast created by the wings, and then exposed to a more powerful blast, so that the dust and chaff is separated from the grain.]

SURFACE CONDENSERS—Daniel Barnum, of New York City ; I claim the method, substantially as specified, of making yielding joints between the tubes and tube sheets in the condensing water compartments of surface condensers, and of thus compensating the expansions and contractions in the tubes, by the means of leaving a portion of india-rubber, or other elastic packing, immediately surrounding each tube, free, so that its elasticity can yield longitudinally with the tubes and compensate for their varying lengths, without causing the packing to slip on the metal, substantially as and for the purposes specified.

I claim also the combination of a relief valve, with yielding joints (without followers) in the condensing water compartments, of surface condensers, for the purpose of preventing the blowing out of the packing, and thus preserving the joints, substantially as specified.

HEMMING GUIDES FOR SEWING MACHINES—Daniel Barnum, of Jersey City, N. J., and S. G. Tyler, of Quincy, Ill. : We claim the manner, substantially as specified and shown in the drawings, of arranging and constructing a hollow conical U-shaped tube, and a slot, j, in combination with a horizontally acting spring plate, or its equivalent, bearing against the slot, j, and tending to press the edge of the flexible material, when the same is placed within the slot into the tube, b, and against the lower side of the concave surface thereof, for the purpose of aiding the hand in turning the hem on the underside, and leaving the fair stitch upon the upper or right side of the garment, as specified.

CULTIVATORS—J. W. and Leonard Batson, of Clarksville, Md. : We claim the arrangement of the reversible concave shovel point, H, reversible shovel point, F, and the cutter, G, with beam, A, and standards, C and D, the whole being constructed and applied in the manner described for the purpose specified.

RIG FOR VESSELS—Thos. Bell, of New York City ; I claim the arrangement and combination of the mast, C, spar, B, and revolving forked mast bench, A, substantially as and for the purpose shown and described.

[The mast of a vessel and its spar or spars are combined in such a manner that the mast turns with the spar or spars, and all the sail spread on the mast is caused to have a similar lifting action on the vessel ; the mast is also attached to the vessel in a novel manner.]

SPRING BED BOTTOM.—Ezra R. Benton, of Cleveland, Ohio : I claim the construction of a b d bottom or spring couch, consisting of a series of double springs, B B' and C C', the longitudinal pieces, G G', and the transverse slats, A A, &c., either with or without the flexible band, I, when arranged as set forth, and operating in the manner and for the purpose specified.

CARDING ENGINES—John Boyd, of Philadelphia, Pa. : I claim the combination of the rollers, B and C, and scrapers, D and E, for stripping the ordinary doffing cylinder of a carding engine, the whole being constructed and arranged substantially as described.

HARVESTING MACHINES—C. R. Brinkerhoff, of Batavia, N. Y. : I claim, first, The combination of the crank, operated by the main shaft, with the rake and sweep post, to which it is attached, and the eighth arm, when arranged in the manner described.

Second, The open work divider, to divide the grain falling upon the platform from the gavel being removed therefrom by the rake, when arranged upon the rake-head, in the manner and for the purpose specified.

Third, The spring-catch marked c, and dog marked a, in combination, and the location of said catch, to break the forward motion of the rake, and its return by the spring, arranged substantially as described.

Fourth, The projection on the lower side of the slot or notch in the dog to arrest the catch with certainty the manner described.

Fifth, The application and arrangement of the toothed rack connected with the spring, by which the rake is caught and held after its descent upon the gavel, the rebound thereof is prevented, and the gavel removed with greater certainty.

Sixth, The placing of a rake (having spring teeth) in the rear of the machine, for the purpose of gleaning and contracting the gavel sheaf into form, substantially as described.

Seventh, The combination of the cam attached to the main shaft, with the arm of the rear rake, to cause it to pass over the gavels at the proper time.

Eighth, The ratchet cam, I, and lever, in combination, substantially as described, for throwing both rakes into or out of action, as set forth.

APPARATUS FOR HEATING FEED WATER OF STEAM BOILERS—J. T. Brooks, of New Albany, Ind. : I claim the described relative arrangement of the force pump, c, water supply pipe, b, heater, d, and steam pipe, f, conveying steam from the upper part of the boiler or steam dome to the heater ; the whole operating together in the manner set forth to heat feed water, on its passage between the pump and the boiler, by means of living steam, and inject it into the lower region of the boiler.

HARROWS—R. W. Buckles, of Grayville, Ill. : I claim two harrows hung to one frame, independent of each other, with two vertical toothed wheels, D D, also working independently of each other, and connected to the horizontal wheels, C C, which are actuated by means of pinions, E, E, as described, for the purposes set forth.

OX-YOKES—Washington Burnham, of Essex, Mass. : I claim the mode of applying the pole ring to the yoke, namely, by means of the staple-rack, and the ring carrier, made so as to be capable of sliding on the rack, and with a pin passage arranged with respect to the notches of the staple rack, substantially in the manner as described, the whole being for the purpose explained.

CURTAIN RACK—J. F. Calhoun, of Wolcottville, Ct. : I claim the combination of tightening screw, c, collar, g, pulley, b, and button, i, for effecting the required tension on the cord, substantially in the manner and for the purposes set forth.

[This is a simple and durable curtain rack, as will be seen from the claim.]

SEWING MACHINES—P. S. Carhart, of Collamer, N. Y. : I claim feeding the cloth, by the combined action of the needle and friction pad, when the said needle and pad operate jointly and in unison to propel the cloth, as the needle descends there through, the cloth being held in its required position by the needle, during the intervals of feed, while the pad is retreating to take a fresh feeding grip on the cloth, essentially as specified.

BREAD KNIFE—Joseph Carrier, of Marlborough, Ct. : I claim the employment or the roller F, the adjustable studs, D, with the collars, C, and thumb-nuts, E, substantially as and for the purpose described.

STOVE PIPES—M. C. Chamberlin, of Johnsonburgh, N. Y. : I claim first, The employment of the spring tube, B, in connection with the pipe, A, when the same is used in the manner and for the purpos specified.

Second, The arrangement of pipe, C, provided with pin, d, with pipe, A, provided with slot, a, and spring tube, B, substantially in the manner and for the purpose specified.

HORSE POWER MACHINES—A. B. Colton, of Athens, Ga. : I claim, first, The stationary wheel, J, and its hub, L, when the same are placed centrally with the large driving wheel, M, for giving motion to the pinions, U V, and gear wheels, R S, revolving with the driving wheel, M, so as to impart a rapid rotary motion to the horizontal shaft, E, having its bearings in the axes of both driving wheel, M, and stationary wheel, J, all arranged in the manner and for the purpose specified.

Second, I claim the sectional yoke, G, as described, in combination with the annular collar, N, and set screws, C, arranged in the manner and for the purposes shown.

[A stationary driving gear is arranged upon a triangular frame, placed centrally with the main driving wheel, so that the hub of the gear shall form a bearing wheel, and the bore a bearing for the horizontal pinion shaft, a series of spur gearing is arranged on either side of the main wheel, so as to communicate a swift rotary motion to a vertical shaft, from which motion can be conveyed by belts, or otherwise to operate any machinery desired.]

JOINERS' BENCH—J. E. Cryer of Peoria, Ill. : I claim, first, The movable jaw, B, constructed and arranged with reference to the permanent jaw, b, in such manner as to secure properly the lumber to be wrought, and at the same time to form a track or guide for the plane during the operation of jointing and squaring lumber, as set forth.

Second, Operating the jaw, F, by means of guides, e e', rod, f, lever, g, and dog, k, substantially as described.

Third, The gage, p, adjustable vertically, with reference to the jaws, B b, in combination with the scale, m, substantially as and for the purposes set forth.

CARPET SWEEPER—Henry Davis, of Bethlehem, Ct. : I claim the arrangement of the rollers, E E' ; to operate in combination with the yielding brush, B, and with the scraper, G, substantially in the manner and for the purpose specified.

[Under the box of the sweeper two rollers are placed parallel with the brush, and so close to it that the brush, as it rotates, sweeps against the rollers which serve the double purpose of rolling the box over the carpet, and aiding the brush to take up the dirt.]

HOMINY MACHINES—Wm. Davis, of Middleburg, Md. : I claim providing the outer cylinder, A, with apertures, a a, gaged to such a size, as while serving to discharge the hulls, also to perform the additional function of discharging the hominy as soon as reduced to the desired degree of fineness, in combination with the inner cylinder, B, when the same is driven at the specific speeds as described, for the purposes specified.

COMPOSITIONS FOR ROOFING—J. M. Day and E. H. A. Oakley, of Aiken, S. C. : We claim the ingredients in the proportions set forth in the specification.

MILLSTONE BUSH—M. DeCamp, of South Bend, Ind. : I claim, first, The adjustable followers, F, provided with convex sides and backs fitted within an oil-box, A, and arranged in relation with the collar, D, of the spindle, to operate as and for the purpose set forth.

Second, The serrated or notched wheels, F, attached to the outer ends of the screws, i, when used in connection with the stops, j, attached to the plates, k, substantially as and for the purpose specified.

[This millstone bush is easily adjusted, keeps the stone true, and prevents waste of oil in lubrication.]

CHIMNEY CAPS—Chas. Douglas, of Hebron, Conn. : I claim, first, The valves, C and D, and the manner and the position in which they are suspended, as described and for the purposes set forth.

Second, The arrangement of the neck, B, the top, E G, and the standards, F F F, in combination with the valve, D, or its equivalent, substantially as and for the purposes specified.

DRY GAS METERS—Saml. Down, of New York City : I claim constructing or arranging the mouths, a' b', of the channels of communication, a b, between the inlet and outlet pipes and the measuring chambers and valve chamber of a dry gas meter, to dip down in the wells below the said pipes, substantially as and for the purpose set forth.

[In dry gas meters it is customary to extend inlet and outlet pipes downward below their communications with their measuring chambers and valve chamber of the meter, to form wells for the collection of water or impurities which, having passed to the meter in a state of vapor, are caused to be deposited in these pipes by condensation ; but no efficient means have hitherto been employed to prevent such matters accumulating in the wells to such a hight as to enter the channels of communication between the inlet and outlet pipes and the measuring chambers and valve chamber, and clogging the valves or otherwise interfering with the meter, except the introduction of glass gages in the sides of the wells, that it might be seen when the liquid had accumulated to such a hight as to render its removal necessary. The object of this invention is to prevent the possibility of the liquids rising too high in the wells, and the invention consists in making the mouths of the channels of communication between the inlet and outlet pipes and the measuring chambers and valve chamber dip downwards into the wells in such a manner that, before the liquid matters can rise high enough to reach the valves or enter the chambers, they will close and seal up the mouths against the passage of the gas, and so shut off the supply until these matters are removed.]

RAILROAD CAR COUPLINGS—Christian H. Eisenbrandt, of Baltimore, Md. : I claim the plates, a a a a, with the springs, a2 a3 a2 a3, the prong-grasping grippers, b c c2 d e e2, with the spring latch, f g h i, constructed, arranged and operated substantially as set forth.

I also claim the hitching pin or bolt, K K, provided with the chain and button or ring, L L m m, when arranged, operated and used in combination with the clasping prong grippers, b c c2 d e e2, and brake lever, q q q r, substantially as set forth and described.

I also claim the combination and arrangement of the sliding belts, n o p, with the prong-clasping grippers, b c c2 d e e2, substantially as set forth and described.

DEVICE FOR SECURING LIGHTNING RODS—John A. Euggren, of Brooklyn, N. Y. : I claim an insulator for lightning rods composed of a glass standard, A, a spring clasp, C, having shanks, i, and shoulders, j, and otherwise made as shown and described.

[This invention consists in having metal caps fitted on or over the ends of the glass insulators, the caps being recessed vertically to receive the conductor, and notched at each side to receive the shanks of a spring clasp which is provided with anchors or shoulders, one at each end. The shoulders pass into recesses in the ides of the insulators and are retained therein by the elasticity of the shanks of the clasps, the latter retaining or holding the conductor in the caps and both the caps and conductor to the insulator.]

DEVICE FOR CLAMPING THE BOLTS IN CIRCULAR-SAWING SHINGLE MACHINES—Kasson Freeman, of Fond du Lac, Wis. : I claim the arrangement of the sliding or adjustable block, with weights, s, attached, or their equivalents, when used in connection with the sliding jaws, D, for the purpose specified.

[Letters patent were granted June 29, 1858, to this inventor for a shingle machine, and the present invention is an improvement thereon. It consists in a better device for operating the jaws or dogs for the purpose of dogging and undogging the bolts, and also in the employment or use of an apron arranged relatively with the saw in such a manner as to carry the sawdust during the operation of sawing. Any further information concerning the invention can be obtained from C. T. Pierson, 24 Broadway, New York.]

TIES FOR COTTON BALES—Edwd. Garrett, of New Orleans, La. : I claim the combination of the two plates, a &c., when made and arranged as or substantially as has been set forth, to form a tie for iron bands for baling cotton, or for similar purposes.

TRUNK LOCK—E. L. Gaylord, of Terryaville, Conn. : I claim the arrangement of the bolt, B, with the springs, c c D, and tumbler, C, operate substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of locks which are self-locking, and are commonly termed spring locks. Locks of this kind have hitherto been constructed in a very simple and imperfect manner, no arrangement having been made to apply a tumbler to the bolt to render it secure against lock-pickers ; such locks, therefore, although very convenient, are only applied to cheap trunks. This invention consists in arranging the bolt of the lock with a tumbler and spring, so as to obtain a spring or self-locking tumbler.]

HORSE RAKES—Elisha Geiger, of Lancaster, Pa. : I claim the arrangement of the cross bar, K, having the flat springs and heads, J, and provided with arms for actuating the supporting bar, F, with, and in relation to the clearing rocker shaft, the whole being constructed and operated as set forth.

CASES FOR STEREOSCOPIC PICTURES—Henry Glosser, of New Nork City ; I claim, first, The arrangement of two or more pairs of eye-glasses on the same side of a stereoscopic case, so that several persons can look at the pictures at one and the same time, substantially in the manner specified.

Second, The piston frames, D, arranged with cogs, i, or their equivalent, at their lower edges, in combination with the cams, j j', j'' and j''', or their equivalents, whereby the same are made to travel from one pair of eye-glasses to the other, substantially as described.

Third, Giving a double motion to the picture frames, first in a direction transversely through the case by the action of the cam, g, or its equivalent, on the endless belt, E, and second, in a longitudinal direction, by the action of the cams, j, substantially as and for the purpose set forth.

Fourth, The arrangement and combination of the endless belts, E and E', to operate in relation to the channel, G, substantially as and for the purpose described.

Fifth, The cams, g and g''', arranged in combination with the cams, j j', &c., or their equivalents, in such manner that they produce the within described motion of the picture frames at alternate intervals, substantially as and for the purpose specified.

[This invention consists in arranging the case with a series of eye-glasses on the same side and with one common reflector for them all, so that a number of persons can have a look at the contents of the case at one time and the picture frames are so arranged that they are brought before the different eye-glasses by the action of one handle, the motion of which is such that a sufficient time is allowed to contemplate each picture.]

WASHING MACHINE—Arthur Gray, of Naples, Me. : I claim the improved washing machine, as made with a a set of fluted rollers and a fluted presser or bucking-board, arranged, constructed and applied to the reservoir, substantially as described, in order to enable the clothes to be both rolled and beaten, as specified, during the operation of washing the same.

STEAM BOILERS—Benj. L. Griffith, of Hazeltownship, Pa. : I claim the combination of the single smoke stack, N, single chamber, F, and double series of flues, M M, with the hollow-binged doors, U U, and diaphragms, K K, arranged and constructed substantially as and for the purpose set forth.

PIANOFORTE ACTION—Napoleon J. Haines, of New York City ; I claim the cross-shaped or four-armed fly, F, applied in combination with the jack, the key and the hammer butt, to operate substantially as set forth.

[The object of this invention is to obtain a very rapid and easy repetition of the blow of the hammer in a pianoforte action without the use of such complicated mechanism as is employed for the purpose in most of the repeating actions heretofore constructed. And to this end this invention consists in the employment of a cross-shaped or four-armed repeating fly, applied and operating in combination with the jack, the key and the hammer, for the purpose of arresting the hammer at a short distance from the string when it falls, after striking, and supporting it in such a manner that, by a very slight rise of the front end of the key, the jack is permitted to enter the notch of the hammer-butt far enough to permit the repetition of the blow.]

MACHINE FOR FILING SAWS—A. Hadley, of Lynn, Mass. : I claim, first, Determining the bevel of the teeth of a straight saw by means of pivoting the frame, g, (which supports the rail, e, and saw-plate, s) at h, and binding rods, f' f'', to said frame, as seen at g' g'', and confining these rods in their relative position by set screws, h' h', constructed and arranged substantially as described.

Second, Determining the bevel of the teeth of a circular saw by arranging the shaft, z'', of the saw between two points, l and m, one of the points, m, being adjustable by means of a grooved piece, p, block, n, and set screw, O, the whole being constructed and combined substantially as described.

Third, Determining the bevel of the straight and circular saws by combining the frame, v, with groover, x'', forming arcs of a circle in combination with clamp screws, s'', and slotted plates, z', substantially as described.

Fourth, Holding the file by clamps, r'' r'', set screws, o'' o'', in combination with shaft, n'', set screw, p'', and bracket, m'', constructed and operating substantially in the manner and for the purpose set forth.

Fifth, The combination of the movable table, O, with the mechanism for supporting and moving the saws, constructed and arranged thereon as shown and described, whereby the same machine can be quickly adapted for filing either straight or circular saws, as set forth.

Sixth, The combination of the mechanism for supporting and moving the saws with the mechanism for supporting and operating the file, constructed, arranged and combined as described, and for the purposes set forth.

HUBS FOR CARRIAGE WHEELS—Luther T. Hazen, of Coventry, N. Y. : I claim enclosing wood hubs for carriage wheels, or other vehicles, with metal cases which form the pipe-box and bands, in the manner described and for the purposes set forth.

MACHINE FOR RAISING RAILROAD TRUCK—William Henney, of Wapello, Ill : I claim the balance, H, arranged with the arms, I, and with the extensions, J, to operate in combination with the piston, E, the serrated bar, L, the pawl, M, and with the eccentric disk, C, substantially in the manner and for the purpose described.

[An extension balance is placed on the top of a piston which is operated by an eccentric disk that acts against a roller in the lower end of the piston, in connection with a serrated bar attached to the side of the latter so that the same, as it is raised step by step, is retained by a pawl, and the vertical arms of the extension balance are provided with hooks which serve to catch under and to raise railroad trucks or other heavy articles.]

OVENS—John F Hoffmeister, of Alton, Ill : I claim the arrangement of the flues, F F', which terminate in the chamber, H, in combination with the additional flue, J, to operate in combination with the rotary platform, E, substantially as and for the purpose specified.

[A rotary platform is arranged over the flues which convey the heat from the fire place, and the heat is carried by two other flues (uniting into one) over the platform, so that the dough which is placed on the platform is exposed to a considerable and uniform heat during the first half of its rotation and to a less heat during the latter half of its rotation, and so a loaf of bread or other article is well baked after it has been once rotated on the platform.]

CLOTHES DRYER—C. R. Hurlbut, of Yorkshire, N. Y. ; I claim the described article of manufacture, constructed as described, to wit, the arrangement of standards, C C, side rails, E E and G G, cross sails, F F D and I I, and sash, B B, provided on their under side with buttons, K K, the whole being jointed, and the several parts acting conjointly, substantially in the manner and for the purpose specified.

COOLERS FOR BEER—Chas. Jones, of Brooklyn, N. Y. : I claim the shell, D, arranged in the cooler, so as to form the two compartments, a and b, to operate in combination with the coil, E, as and for the purposes described.

[This is an excellent beer cooler, which reduces the temperature of that (by some) much admired beverage without detracting from its exhilerating or tonic properties.]

MANUFACTURE OF WATERPROOF CEMENT PIPES—Alfred Fauvin Jalouneau, of Paris, France. Patented in France Dec. 30, 1857 : I claim the manufacture of strand water-tight tubes or pipes by the process set forth.

SEPARATORS FOR SMUT MACHINES—G. P. Jordan, of Burlington, Iowa ; I claim, first, The combination and arrangement of the scourer, I, with the spout, D, chamber, C, and box, B, provided with the blast chambers, b b, spout, H, fan, F, and screens, u v, substantially as and for the purpose set forth.

Second, The employment or use of the valves, c', placed in the partition plates, a a, when used in combination with the fan, F, chamber, C, spout, D, and scourer, I, and arranged relatively therewith, as and for the purpose set forth.

[The scourer in this smut machine is constructed in a novel manner, and is used in connection with screens, blast passages and a fan, in such a manner that the separation of smut and other impurities from grain is effected by a very simple machine.]

CHURN—Wm. Kelly, of Hastings, Mich. : I claim the combination of the dashers, E E, with the slide partition, D, and connecting rods, F F, as described, the parts being so connected to the frame that the oscillations of the churns shall operate the dashers, E E, and force the cream against and through the slide partition, substantially as set forth ; not intending to claim the operation of the dasher or dashers by the oscillations of the churn, but only the combination and arrangement of the vibrating dashers with the movable partition and concomitant parts, as described for the purposes set forth.

HARVESTING MACHINES—Jesse Little, of Chambersbury, Pa. : I claim the arrangement of the sliding brace, A, in combination with the tongue, p, and bar, B, constructed and operating in the manner described for the purpose specified.

Second, The combination and arrangement of the caster plate, c c, jaws, I I, and segments, G G, in the manner and for the purpose described.

PROPELLING AND STEERING APPARATUS—Murdick Lythe, of Alleghany, Pa. : I claim, first, The shaft, b, with a supporting arm or arms, g, and bearing recess, v, in combination with the propeller or paddle-wheel shaft, K, the whole being arranged in the manner and for the purposes set forth.

Second, The tubular shaft, c, with gear wheels at the upper and lower ends, in combination with the shaft, b, and propeller shaft, K, the whole being constructed and arranged in the manner and for the purposes set forth.

PROPELLER—Levi H. Markley, of Line Lexington, Pa. : I claim the arrangement and combination of the peculiarly acting paddle blades or fliers, F, pivoted frame, E, rods, G, hooks, J, sliding block, H, and reversing and bracing bar, I, as and for the purpose shown and described.

[This invention relates to that class of propellers known as duck-foot propellers, and consists in suspending the reciprocating sliding-frame or frames in which the oscillating paddle blades or fliers are secured on pivots, and combining therewith a series of parts for

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holding the frame in an upright position and guiding it in its backward and forward movements, and for changing its position so as to reverse the action of the paddle blades or fliers upon the water.]

METHOD OF FORMING PLOW HANDLES—Geo. W. Matthews, of York, Pa.: I claim the arrangement and combination of the carriage, C, provided with the patterns or curved surfaces, f, the adjustable rotating cutter head, I, belt, H, adjustable shaft, D, provided with pinion, C, and the rack, b, attached to carriage, C, substantially as and for the purpose set forth.

[Two rotating cutter-heads, provided with novel cutters, are used in connection with a carriage in which the "stuff" to be operated upon is centered, and which carriage is provided with a pattern to actuate one of the cutter-heads, the axis of which is fitted in movable bearings. By this arrangement the "stuff" is fed to the cutters and the movable cutter-head adjusted by the forward movement of the carriage, and both the carriage and cutter-head operated from a single driving shaft, the whole forming a remarkably efficient machine.]

METALLIC PIPE—W. S. Mayo, of New York City: I claim the application of longitudinal strips, B, to the surface of a metallic pipe, in combination with the coiled wire covering, C, whereby I am enabled to insure great strength with a less thickness of metal, substantially as described.

[The piping that is the subject of this patent has longitudinal strips of metal laid along it at certain distances apart, and wire of a suitable size is coiled around it either closely or loosely, as may be desired, whereby strength, cheapness and durability are eminently attained.]

BAG FASTENER—Wm. P. Maxson, of Albion, Wis.: I claim the employment of the oblong grooved faced plate, A, or its equivalent, having two segments of its middle portion punched out, so as to admit the string and fasten it to the bag, in combination with the string, B, and ring, E, when constructed to operate upon the principle of the wedge, substantially as and for the purpose set forth.

EGG BEATER—Thos. McBean, of Fowlerville, N. Y.: I claim the double spiral dasher, A, in combination with a square box, where the same are arranged substantially as specified.

SEED PLANTERS—John McKown, of Gaardstown, Va.: I claim the arrangement for united operation of the horizontally-moving hand-lever, K, vertical shaft, J, horizontal elbow lever, I, horizontal slides, H H, divided hopper, G, seed tube, F, and vacuum-plate, L, substantially as and for the purposes set forth.

SEATS AND COUCHES FOR SLEEPING CARS—Thomas E. McNeil, of Philadelphia, Pa.: I claim, first, Two adjacent seats, each seat having detachable cushioned boards, G, and E, and each having a permanent end frame, D, and a rear frame, F, with upper and lower ledges, i and h, in combination with the swing-bracket, H, and rib, I, or their equivalents, the whole being arranged substantially as set forth, so that the cushioned boards, G, of the two adjacent seats may form one couch, and the boards, E, of the same seats, another couch, and so that when the said boards are arranged as couches there may be a space between them, and the permanent end frames, D, for the purpose specified.

Second, Constructing and arranging the end frames, D, of four seats, substantially in the manner set forth, so that they may serve as supports for the cushioned platforms, which form the two intermediate berths.

ATTACHING THILLS TO AXLES—John Miller, of Bucyrus, Ohio: I claim the adjusting and securing the hook, s, on the pin, i, by means of the circular face, b c, on the jaws D D, and the shoulders, r r, on the iron, E, substantially as and for the purpose set forth.

THRESHING MACHINES—John R. Moffitt, of Piqua, Ohio: I claim the described arrangement of fixed bearings, t, set screws, e, (in the line of adjustment,) and hinged concave heads, c d, the whole operating together to set, and rigidly retain the toothed portion of the concave at any desired proximity to the threshing cylinder, while at the side at which the unthreshed grain enters, its distance is substantially unchanged.

MACHINE FOR DRESSING KID SKINS—Timothy Newhall, of Lynn, Mass.: I claim the rotary brush, F, in connection with the reciprocating bed, or carriage, C, connected with its guide-rods, B B, by springs, D D, the parts being arranged to operate substantially as and for the purpose set forth.

[The object of this invention is to brush up a gloss on kid and other thin skins, after being colored and gummed. The invention consists in the employment of a rotary brush in connection with a reciprocating yielding bed, arranged to produce the effect desired.]

SMUT MACHINES—T. A. Noble and Erastus Coy, of Akron, Ohio, and James B. Augell, of Alleghany, Pa.: We claim, first, The adjustable hoop, C, in connection with the increased chamber, f, to regulate the blast passing up through the circular opening, N, also the adjustable ring, D, to regulate the blast coming up through the circular opening, E; the operation in both cases being to increase or diminish the blast, as may be required, substantially as set forth.

Second, The chamber, G, in combination with arm, F, and spout, L, when said chamber is placed above the revolving chamber, H, to catch the screenings, substantially as set forth.

Third, The revolving chamber, H, provided with sides, h, and rim, h', for distributing the wheat evenly as it falls over the edge of the rim, h', so as to be more effectually operated upon by the blast passing up the opening, E, and also the flange, M, upon cylinder, L, for the similar distribution of the wheat to the second blast rising through opening, N, as set forth.

Fourth, Making the conical scourer, O, adjustable perpendicularly, both independently of shaft, A, and disc, L, and in connection with said shaft and disc, substantially as set forth.

MACHINES FOR CUTTING SOLES—John S. Shattuck, of Malden, Mass.: I claim the alternating or vibrating segment carrying the two cutters, having the toe and heel in opposite directions.

I claim the yielding table which supports the leather as it is fed forward, and the yielding gauge by which the leather is brought to the right position to be operated upon by the cutters.

I also claim the projecting knife-edge at the heel and toe of the cutter, by which the scraps are detached from the strip of leather.

FOLDING CRADLE—L. K. Selden, of Haddam, Conn.: I claim, first, The rockers, A, of a cradle, arranged with slats, a, or their equivalents, and operating in combination with the bottom braces, B, the upright cross-bars, C, the longitudinal bars, D, and the top bars, E, substantially in the manner and for the purpose specified.

Second, The arrangement of the slides, b, in combination with the bottom braces, B, and with the upright cross-bars, C, to operate substantially as and for the purpose described.

[The cradle-frame is constructed in such a manner that it folds up into the length of one of the rockers, and when unfolded it is firm and secure.]

STRAW CUTTERS—George Roushe, of Lima, Ohio: I claim the relative arrangement for united operation in a straw-cutter, of the reciprocating cutting-knife, C, when arranged in a circularly-moving frame, reciprocating feeding-rake, E, and rising and falling pivoted press-board, G', said parts being connected and operated in the manner set forth.

PLATFORM SCALES—Elnathan Sampson, of St. Johnsbury, Vt.: I claim attaching the rails, A A, of the platform direct to the sleepers, B, which are connected at each end by links, m, to yokes, H, fitted on levers, E, the lower ends of said levers, at each side of the platform, being connected together and to the shaft, G, of the scale-beam, by rods, g, substantially as and for the purpose set forth.

I also claim the employment or use of the adjustable rods, F, attached to the levers, E, to permit of the compensation of the same for the purpose specified.

[The object of this invention is to adapt what is "platform scales" to a railroad, in such a manner that the scales will be rendered extremely durable, all the difficulties attending the ordinary mode of application being obviated, and the device rendered much more simple and efficient.]

BUCKLES—Adolph Roesler, of Warsaw, Ill.: I claim the tug-plates, A A, the trace-plate, D, having one or more knobs, o, the fork-shaped hame-hook, g, and screw rod, b, all arranged substantially as described, and for the purpose specified.

CAR COUPLINGS—Richard Rickkon, of Rochester, N. Y.: I claim constructing self-adjusting car-couplings, with a series of grooves, g, as above specified, so as to admit of the coupling (with self-couplers) of cars of unequal hights, for the purpose set forth.

BURNERS FOR VAPOR LAMPS—Robert Ramsey, of Philadelphia, Pa.: I claim the combination of the wick tube, B, the gas chamber, C, the tube, D, and jet, E, arranged and operating substantially as described.

STOVES—Richard B. Pullan, of Cincinnati, Ohio: I claim a rotating vessel, provided with two grates, and a central row of grate-bars arranged within stoves in such manner as to form two fire-chambers, one above the other, and which may be used alternately, substantially in the manner and for the purposes set forth.

MACHINE FOR STRIPPING AND CUTTING SUGAR-CANE FOR GRINDING—Luther E. Porter, of Lake Mills, Wis.: I claim, first, The divided clasp, H H, i i k k, arranged substantially as described.

Second, In combination with the above I claim the spring cutters, m, m, all constructed, arranged and operating substantially as described for the purposes set forth.

METALLIC SHIELDS FOR BOOTS AND SHOES—Jonah Platt and Myron D. Brooks, of Akron, Ohio: We claim the construction of boot and shoe shields having an opening in front to prevent water or sand from being entrapped between the shield and the leather, substantially as described.

SEATS FOR CHURCHES, SCHOOLS, ETC.—Charles Perley, of New York City: I claim the combination of the swinging bracket, q, with the turning seat, d, connected and acting in the manner and for the purposes specified.

CHUCK FOR SCREW-CUTTING—Richard Nuttall and John Kirkpatrick, of Alleghany, Pa.: We claim, first, The ring, D, having a portion of the inside cut away or recessed for the purpose of making room for the outer end of the cutting dies, said ring being furnished with cams, e, on the inside, and with a spring catch, h, lever, g, cam, k, and locking stud, l, on the outside, as described and for the purpose set forth.

Second, The cam chamber, w, in the die box, b, when used in connection with the cams, e, and ring, d, as described and for the purpose set forth.

Third, The regulating-stud when made in three parts, as herein represented, and used in connection with the die-box, b, ring, d, and spring-catch, h, as described and for the purpose set forth.

Fourth, The combination and arrangement of the die-box, b, cutting-dies, f; and cap, c, with the ring, d, the whole being combined, arranged, constructed and operated as described, and for the purpose set forth.

Fifth, The eccentric lever, j, on the face-plate, d, when used in combination with the lever, g, cam, k, locking-stud, l, and spring-catch, h, as described and for the purpose set forth.

MACHINE FOR CUTTING SCREWS—Richard Nuttall and John Kirkpatrick, of Alleghany, Pa.: We claim, first, The combination and arrangement of the levers, m and n, rods, k and l, stops, o and p, and springs, Q, with the bolding or sliding head, d, and eccentric lever, r, the whole being combined, arranged and constructed in the manner described and for the purpose set forth.

Second, The use of the sliding or holding head, d, and eccentric lever, r, when used for the purpose of opening and closing cutting-dies in chucks for screw-cutting.

SPRING BALANCE FOR WINDOW SASH—F. H. Smith, of Plainville, Conn.: I claim the manner of securing the pulleys in the head jamb of the window frame, as described, the manner of winding up and adjusting the two pulleys through one orifice, for the purpose described.

COAL SCREEN—Jasper Snell and John R. Delhm, of Pottsville, Pa.: We claim the arrangement of the plates or blades, C, in parallel planes, with spaces between their edges, so as to slope lengthwise of the screen, and crosswise from the center of the screen, substantially in the manner and for the purpose specified and set forth.

FRICTION PULLEYS—Edward Spalding, of Westborough, Mass.: I claim the combination of the tubular rest, D', with the driving pulley, A, the hanger, E, or its equivalent, and the shaft, C, of the driving-pulley, B, the pulleys being arranged and made to operate with respect to one another, essentially as specified.

SAILS FOR FORE AND-AFT RIGGED VESSELS—A. Washington Stewart, of Cambridge, Md.: I claim as my improvement in foresails the clue-sail, b, of the form specified, united to the after-leach of the fore-sail, and managed by sheets, e e', as set forth.

SEED PLANTERS—Stephen L. Stockstill, of Medway, Ohio: I claim the described arrangement of the open notches, l, l, l, pivot, m, drag-bar, k, and pin, p, the whole being constructed in the manner and for the purpose set forth.

MECHANISM FOR VARYING SPEED—James A. Stoddard, of Milford, Mass.: I claim graduating or varying speed, by means of pulleys, or their equivalents, operated in connection with surface-wheels, or their equivalents, in such manner as to receive and transmit the motion at variable distances from their centers, when constructed and operating substantially in the manner set forth and described.

PORTABLE WAGON JACKS—Henry Stowell and Lorenzo Spencer, of Placerville, Cal.: We claim the peculiar arrangement, combination and adaptation for the purpose of raising the axles of wagons and other heavy bodies, to which the foregoing invention may be adapted.

WEIGHING SCALES—Francis M. Strong and Thomas Ross, of Brandon, Vt.: We claim the employment of an auxiliary frame, substantially such as described in combination with and interposed between the platform and levers, substantially as described and for the purpose specified.

We also claim constructing such intermediate frame in two parts, connected by movable joints at the angles, substantially as and for the purpose specified.

We also claim the manner of constructing and inserting the bearing-blocks that rest on the knife-edges, substantially as and for the purpose specified.

We also claim bringing the ends of the arms immediately one above the other, in combination with the mode of connecting the two with the beam, by single and double connecting-rods, substantially as described and for the purpose set forth.

PLATFORM SCALES—Francis M. Strong and Thomas Ross, of Brandon, Vt.: We claim arranging the series of rocking levers which sustain the platform, with their shafts all parallel, and with the arms of all of them in the same line, except those constituting the inner section, which are inclined, substantially as described, in combination with the transmitting lever above which connects with the scale-beam to the short arms of which they are all suspended at equal distances from the axis of vibration, substantially as and for the purpose described.

We also claim the method of connecting the several sections of the shaft of the transmitting lever, by means of projections and links, substantially as described, for the purpose of enabling it to yield freely to inequalities or variations in the supports, that it may vibrate freely and without binding, and thereby transmit the weight accurately to the scale-beam, as described.

We also claim suspending the bearing blocks by two links, in manner substantially as described, so that any swinging motion of the levers will not cause the blocks to vibrate on the knife edges, by which means we are enabled the better to preserve fine knife-edges, so essential to accurate weighing.

We also claim constructing the bearing pieces with convex face and projecting tenon, substantially as described, whereby they are rendered self-adjusting, that the knife-edges may bear without binding, as set forth.

And we also claim, in combination with the nose-iron adjustable by a screw in the end of the transmitting lever, the employment of a spring bearing against the end of the adjusting screws, substantially as described and for the purpose set forth.

MACHINE FOR CUTTING IRREGULAR FORMS—Isaac T. Tice, of Baltimore, Md.: I claim the employment or use of the vibrating bed, B, with fence or gauge, E, and feed or pressure rollers, F G, attached in connection with the rotary cutter-head, H, fitted in stationary bearings on the platform or table, the whole being arranged to operate substantially as and for the purpose set forth.

[A fence or gage, as well as a feed and pressing roller, is used in connection therewith, by which means a simple machine for cutting wood moldings, and one that may be operated with great facility, and that will do its work with great rapidity, is obtained.]

SUGAR-CANE HARVESTERS—Robert R. Taylor, of Reading, Pa.: I claim the two sets of rotating cutters, one set being situated above and in advance of the other set, in combination with the reel, n, and shield, L, the whole being arranged substantially as and for the purpose set forth.

MACHINE FOR CUTTING SOLES—John Thompson, of Marblehead, Mass.: I claim the arrangement and application of entire sole-cutters, K, L, (viz: such as are capable of cutting out an entire sole, finished on its sides, toe and heel,) on opposite sides of a rotary shaft, G, so that after each semi-revolution of such shaft, and during each descent of it an entire sole, with heel and toe complete, may be cut from the piece of the leather by one of such sole-cutters acting thereon, and while the piece of leather is supported on the bed or block under such shaft.

I claim the application of the catch and cams to the pinion, and a spring slider applied to the shaft, G, and so as to operate therewith, substantially as specified.

I claim, in connection with the entire sole-cutters, K, L, applied to opposite sides of the shaft, G, and operated as described, a gage, V, and mechanism to operate it in such manner as first to move it up to the path of the cutter, and carry it away therefrom sufficiently to enable the sole that may have been cut to be discharged from the supporting bed, as described.

ROCKING CHAIR—Thos. H. Tatlow, Jr., of Palmyra, Mo.: I claim a rocking chair, having its arms extending down to the rockers, and its back arranged and operated as specified.

[This invention consists in extending the arms of the chair down behind the seat to the rockers, so as to form a circular arc, the under edge of which is provided with saw-teeth, which serve to retain the back in any desired inclination, by means of a rod with two rectangular bends at each end, which rod is attached to the back, and the bends of which are forced into the saw-teeth attached to the extensions of these arms, by means of springs.]

REEFING FORE AND AFT SAILS—James L. Townsend, of Newburyport, Mass.: I claim the application of the gaff, C, to the mast, A, so as to be capable of being dropped downward, on either side of the sail, into or about into parallelism with the mast, as specified, in combination with the application of one or two head reefing lines, L L', to the gaff and the sail, so as to enable the slack of the leach and upper part of the sail to be taken up, and also the lower end of the gaff to be secured, in order to effect the reefing of the sail, as specified.

I also claim, in combination with the said means of reefing the head, and producing the lap of the sail, one or more buntlines, or lap securing lines, M, M', N N', applied to the leach and the body of the sail, substantially in manner and to operate as described.

MOLDING MACHINE—Chapman Warner, of New York City: I claim, first, The method of packing the sand by dropping it from any given hight, substantially in manner described.

Second, The mode of obtaining the same result by means of revolving bladed shafts, substantially as described.

Third, The double-hinged flask, constructed and secured by plates and pins, substantially as described.

Fourth, The table constructed substantially as described, under and independent of the molding board, capable only of a vertical motion communicated to it by the arrangement described, or any one equivalent thereto, and working in connection with the molding board, through which latter the patterns, which are fastened on the table, protrude.

Fifth, The mode, substantially as described, of supporting the molding board, from beneath and through the table.

Sixth, I claim the combination of apparatus for packing the sand with the mode of hinging and securing the flask by plates and pins, and with the vertically working table apparatus for withdrawing the patterns from the sand through the molding board, supported as above described, and the whole operating substantially as described.

RING TRAVELER SPINNING FRAME—Joseph W. Wattles, of Canton, Mass.: I claim the improved arrangement of the ring flanches by which the traveler is supported, and on which it slides, the same consisting in arranging them with refereuce to the ring, or its axis, substantially as shown in the accompagying drawings.

HARVESTING MACHINES—Jesse Whitehead, of Manchester, Va.: I claim, first, The supplemental discharging rake, O, arranged with its actuating mechanism, substantially as shown and described, so as to operate automatically and conjointly with the platform rake, K, for the purpose specified.

Second, Attaching or suspending the rake-head, J, to the shaft, H, by means of the pulley, d, rod, I, oblique bars, f f, and pulley, h, substantially as shown and described, whereby the head, J, is allowed to vibrate, and is perfectly guided or retained on the shaft, H.

[Letters patent were granted to this inventor on Dec. 2, 1856, for an automatic raking attachment, on which this is an improvement. The object of this invention is to render the device more compact than formerly, and also to insure the free discharge of the grain so that the same will be delivered in compact gavels, and therefore bind into sheaves with facility.]

CULTIVATORS—W. I. Wilson, of Franklin, Ind.: I claim the arrangement of axles, A and E, wheels, B, levers, C, C, shanks, D D, plows, a a, cross-piece, I, guides, F F, and arms, d d, for operating conjointly in the manner and for the purpose set forth.

SAW FILER—Solon Wood, of White Pine, Pa.: I claim the arrangement of the cutters, C, on an arbor, B, the bearings of which are so arranged that the cutters are subjected to the action of adjustable spiral springs, or their equivalents, substantially in the manner and for the purpose specified.

And I also claim the additional arm, e, which is hinged to the bar, a, in combination with the sliding pieces, g, for the purpose of allowing the cutters to follow the action of the springs, h, in two directions, substantially as described.

[This invention consists in arranging a series of revolving cutters, which correspond to the shape of the saw-teeth, on an arbor, which has its bearings in a frame that can readily be attached to the saw, the arbor being so arranged that it can be rotated by means of bevel wheels, and that the cutters are kept up to the work by spiral springs, the strain of which can be regulated by set-screws.]

GONG OR BELL FOR SIGNALS—Isaac F. Woodward, of Philadelphia, Pa.: I claim the escapement bar, B, constructed substantially as described, in combination with the end, J, and pin, K, of the hammer or striking arm, C, the whole arranged substantially as described and for the purpose set forth.

MACHINES FOR MAKING CLAY PIPES—Henry Aregood, of Mansfield Township, N. J., and Stephen Ustick, of Philadelphia, Pa., assignors to John L. Macknight, of Bordentown, N. J.: We claim, first, The annular ring, q', upon the core pin, H, (which is also provided with a foot), in combination with a flange upon the inside of the outer front end of the mold, G, to retain the core pin in place while forming the bell end of the pipe, operated in the manner and for the purposes specified.

Second, The cam wheel, I, in combination with the piston, J, trough, B, and its connections, mold, G, and core pin, H, for making the bell end and straight part of the pipe at one operation.

Third, The combination of the rock-shafts, O and O', with the two halves of the mold, C, the former being operated by the cam wheel, M, and shaft, N, for the purposes described.

Fourth, The slide, D, rod, R, and cam strip, Q, arranged as described, for the purpose set forth.

Fifth, The arrangement and combination of the cam, U, rock-shaft, T, and levers, W and V, for operating the knife, I, in the manner and for the purpose specified.

WRENCH—Henry J. Behrens, (assignor to Charles S. Pomeroy,) of New York City; I claim providing the socket, C, of the screw, with a pivot or hinge, substantially in the manner and for the purpose specified.

CARPET SWEEPER—Wm. G. Budlong, (assignor to Hamilton W. Conklin and James W. Corning,) of Hartford, Conn.: I claim, in combination with the gear-wheel, D, and pinion, f, at either end of the case, the lever, C, and screw, h, by which the hight of the brush is adjusted and the pinion is engaged with the driving gear, arranged substantially as and for the purpose specified.

BURGLAR'S ALARM—John G. Clark, (assignor to himself and Samuel W. Hatch,) of Auxusta, Ga; I claim, first, The employment of one or more cap nipples, C, on a suspended gravitating breech-piece or plate, to receive a percussion cap or caps when said breech-piece forms part of a burglar's alarm, substantially as and for the purpose set forth.

Second, Providing said suspended breech-piece or plate with a vertical stem, and arranging to slide over said stem a tubular weight, so that when the alarm detaches from the door and strikes the floor, the percussion force of the breech-piece and weight will explode the cap or caps and produce the desired alarm, substantially as set forth.

Third, Arranging the spring on the stem of the breech-piece between the breech-piece and weight, so that the same shall be held far enough apart to allow the necessary movement of the same toward each other to explode the cap or caps when the alarm strikes the floor, substantially as set forth.

Fourth, Providing serrations on the under side of the suspending bracket, so that said bracket shall move with the door until it clears the framing, substantially as and for the purposes set forth.

[This is a little device to be carried in the pocket by travelers. On going to bed it is attached to the door by pushing a bracket in between its upper edge and the upper part of the frame. From the bracket the alarm is suspended by means of a chain above the floor. When the door is opened the bracket detaches and the alarm falls to the floor. The concussion of the breech-piece, which carries percussion caps, with a descending weight explodes the caps and produces an alarm, thereby warning the sleeper of the approach of burglars. We think this a capital little device, and every traveler should provide himself with one.]

APPARATUS FOR COOKING BY STEAM—H. W. Horton, of Wheaton, Ill., assignor to Oliver H. Horton, of Chicago, Ill., and Roswell E. Adams, of Wheaton, Ill.: I claim the described arrangement of a steam boiler, C, in combination with a steam chamber, E, which communicates with the boiler by means of a slide, e, or its equivalent, and one end of which contains the oven, G, the whole being arranged substantially as and for the purpose specified.

[This invention consists in arranging over a closed space formed in the lower part of a box with a flat bottom, a steam chamber, which communicates with the boiler by means of a slide which can be operated from the outside, and part of which forms a separate compartment or oven smaller than the chamber, so that when the chamber is filled with steam the oven will be surrounded by it except where the door is, the whole being so arranged as to cook articles in the steam or in dry air, and that the oven serves for baking.]

HOSE COUPLING—N. N. McLeod, (assignor to Carroll E. Gray,) of St. Louis, Mo.: I claim making the lip, c, around the conical end, D, so as to leave a cavity to receive the end of the pipe, B, and the screw nut, A, when the said lip, c, is a part and portion of the same piece that the cone, D, is, as shown and described.

WATERPROOF SOLE—John W. Smith, of Washington, D. C., assignor to himself and Walter W. Perry, of Baltimore, Md.: I claim, as a new article of manufacture, the waterproof inside sole, when constructed of the compound, above described, placed between two sheets of paper, in the manner set forth.

SPLINT BROOM—John W. Wheeler, (assignor to Alden B. Stockwell,) of Cleveland, Ohio: I claim the formation of brooms composed of separate wrought splints, when constructed in the manner described and set forth, as a new article of manufacture.

MACHINE FOR CHANNELING AND EDGING SOLES OF BOOTS AND SHOES—Martin Wesson, (assignor to himself and D. B. Wesson,) of Springfield, Mass.: I claim, first: The combination of the feed rolls, E F, adjustable knives, b b', and the guide, R, when constructed and operating substantially in the manner and for the purpose set forth.

Second, The combination of lever, L, sliding pieces, h h', and knives, b b', when arranged and operating as described, and forming a knife-holding arrangement, for the purpose specified.

[Continued on page 327.]

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New Inventions.

Substitute for Gutta-Percha.

In a communication to a Paris periodical, M. Serres states that a gum is obtained from the *Acros Balata* (a tree that grows wild in the West India Islands) which is more elastic than gutta-percha, and preferable to it for covering telegraphic wires and such other purposes. It is formed of the juice of the balata, is of a spongy rose color, and possesses the quality of softening at a temperature some degrees higher than that at which gutta-percha becomes plastic. We have no doubt but there are many trees and shrubs in various parts of this country, the sap of which is capable of making gums similar in character to caoutchouc and gutta-percha. Our southern pines supply more turpentine and resin than those of any other country: some of our other trees may yet be hunted up to supply an equal proportion of "elastic gum."

Enfield Rifles.

We have taught England an important art in providing munitions of war, namely, the manufacture of small arms by machinery. Prior to the late war in the Crimea all the small arms for the British army were made by private parties, with whom contracts were made for this purpose, Sheffield and Birmingham being the headquarters of British musket-making. Most of the parts of these small arms were forged and fitted by hand labor, consequently the one was never an exact duplicate of the other. When a screw, spring or pin broke in the hands of the soldier, as no exact counterpart was provided, an armorer was required to make the repair. This oftentimes caused much trouble, and was fatal to prompt and efficient action in many cases. This defective system was made apparent during the war referred to, and information of the success of the American government armories having been carried across the ocean, a commission was appointed to visit the United States and obtain positive knowledge regarding the facts of the case. The result of this Commissions' labors was the establishment of a large factory at Enfield, not far from London, for the manufacture of army rifles, and great success has attended the movement. We are not surprised at this, because the most skillful and experienced American mechanics were at once employed by the British authorities to conduct and carry on the operations; Mr. Burton, of Harper's Ferry, being the Superintendent. Quite a number of American machines were imported for making the separate parts, each a duplicate of the other, so as to avoid the evils that had attended hand-made muskets. It is now stated that the best soldiers' rifles in the world are manufactured at Enfield, and that Mr. Burton has invented several improvements which have greatly conduced to this result. The Enfield rifles for the army are muzzle loaders; but the marines in the navy are about being provided with breech-loading rifles, and all the most efficient agencies are employed for personal offense and defence. In the war of the Revolution, and of 1812, American rifles told fearfully upon the British ranks, but in another war, we would find their soldiers equally as good, if not better shots than our own.

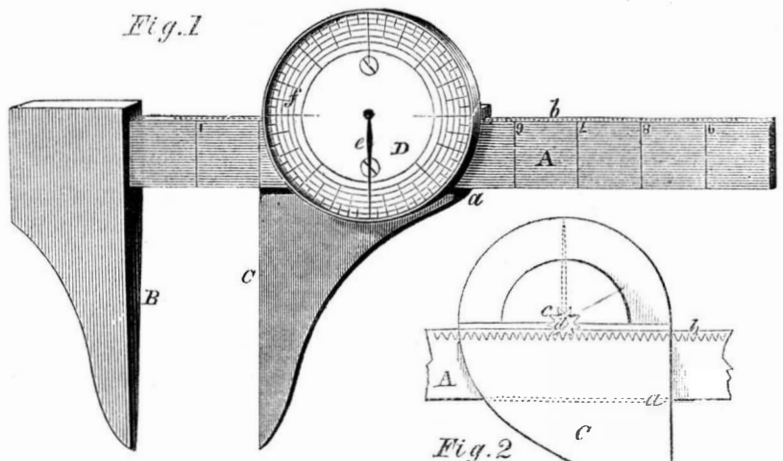
Improved Callipers.

The instrument called "callipers" is one of the most useful appliances for measuring goods, whether in bales, bundles or boxes, large or small, and the device which forms the subject of the above illustration is designed to ensure an accuracy of measurement never before attained, and a facility of reading off minute fractions of an inch up to hundredths, two hundredths, or more.

The head of the calliper, B, has secured to it, at right angles, a graduated bar, A, which is divided into inches, and which has a rack, *b*, sunk into its upper edge. The movable leg of the calliper, C, slides on A by a groove, the lower side of which, *a*, is in contact with the lower or even side of A; the upper part of C has an arbor, *d*, through it, that, at the back, Fig. 2, carries a toothed wheel, *c*, that fits in the rack, and in the front, Fig. 1, a pointer or index, *e*. To the front of C a disk, D, is fixed, having graduations, *f*, all around it, dividing it into any number of inches and

GOULD'S CALLIPERS.

Fig. 1



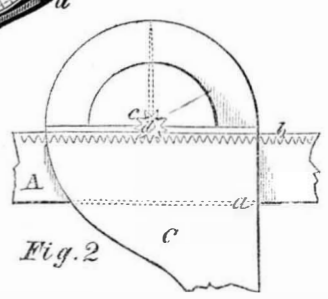


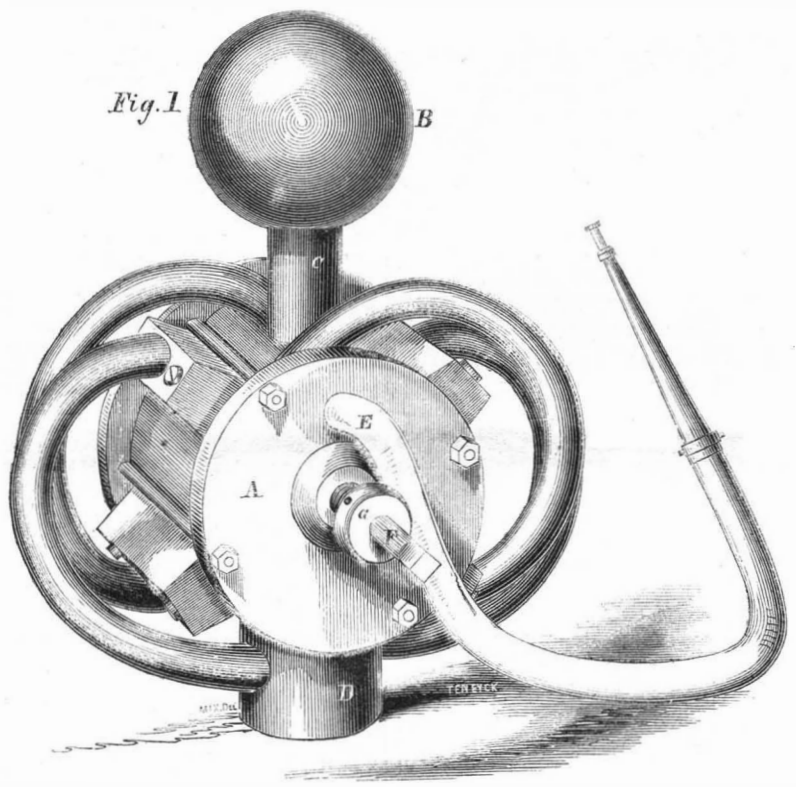
Fig. 2

parts of an inch, with relation to the inches on A, as may be desirable, so that, as C is moved the toothed wheel, *c*, rotates, carrying with it the pointer, *e*, by whose means the exact size of the object or the distance apart of the callipers may be accurately noted.

The inventor, Fayette Gould, of Huntington, L. I., will give any further information desired upon application to him. The patent is dated April 12, 1859.

LAWRENCE & SAFELY'S PUMP.

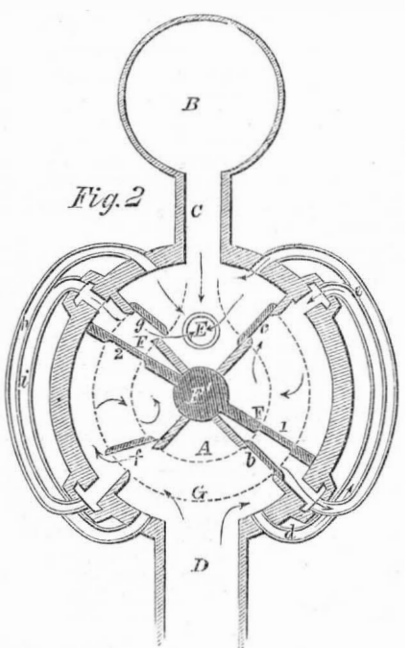
Fig. 1



Our engravings illustrate the exterior and interior arrangements of a pump invented by Edwin Lawrence and Robert Safely, 2d, of Lansingburg, N. Y.

Fig. 1 is a perspective view and Fig. 2 a vertical section. The cylinder, A, may be composed of any metal or alloy, and should be cast of such a thickness as strength and durability require, the diameter and length being determined by the capacity desired to be obtained, the whole being protected by a suitable frame. The arms or piston, F, is fitted to move inside the cylinder, and is provided with packing. The arms, F, are secured to a shaft, F', passing through the centre of the cylinder and through stuffing-boxes, *a*, on the heads of the cylinder. The pump may be operated by means of brakes and the rock-shaft ordinarily used upon fire-engines, or any suitable way of obtaining an oscillating circular motion. D is the suction hose, B the air-chamber, C the pipe leading to it, and E is the discharge opening. The air and vacuum chambers are designed to give regularity to the ingress and egress of the water to and from the pump, when the arm, 1, is elevated, water is raised into the vacuum chamber, G, through D, and out of it through the valve, *b*, and by the same movement of the arm, water is propelled through the valve, *c*, into the air-chamber and through the hose,

Fig. 2



while, by the simultaneous downward movement of the arm, 2, water is raised through the suction pipe, D, tube and valve, *h*, and tube and valve, *i*, into E. When the arm, 2, is elevated, water is raised by suction through D into G, and out through the valve, *f*, into its chamber, and the water previously in its chamber into the air-chamber by the valve, *g*, while, by the simultaneous downward movement of the arm, 1, the water is forced through the pipe, *e*, into E, and drawn through *d* into the chamber in which I works.

There are many situations to which this pump is peculiarly adapted, and the simplicity of its parts and its ease of action entitle it to receive consideration by all who use this convenient mechanical appliance.

The patent is dated March 1, 1859, and the inventors will be happy to furnish any information upon being addressed as above.

Dionysius Lardner.

The news of Humboldt's decease has been rapidly succeeded by intelligence of the demise of Dr. Lardner, one of the most popular lecturers and writers on scientific subjects that ever lived, and who was well known in this country. He was a native of Dublin, Ireland, in which city he was born in 1793, and was therefore 66 years of age at his death, which occurred on the 8th of May, in Naples, where he had been residing during the past two years. His father had sufficient wealth to give him a good university education at Trinity College, intending him for the legal profession. His tastes, however, were adverse to spouting in courts of law, and so he devoted himself to scientific pursuits, and with such success that he took sixteen prizes, while a student, for scientific essays. In 1817 he left Ireland and took up his abode in Cambridge, England, where he soon distinguished himself for attainments in mathematics and natural philosophy. He also acquired a deserved popularity as a lecturer on scientific subjects by a happy faculty of perspicuous illustration; and at the same time, as an author and a contributor to the Edinburgh *Encyclopædia*, he established his reputation for general and correct information on astronomy and mechanics. At 34 years of age he was appointed professor of natural philosophy in the London University, and for several years he was the most popular scientific personage in that city. In 1840 he came to the United States under a compulsory visit, with the young wife of a British captain, and the affair caused much public comment at the time. In order to secure the means of support he commenced a series of popular scientific illustrated lectures in this city in 1841, and afterwards repeated them in all our large cities. They were very successful, and were far superior to anything that had been attempted among us before. We can add our personal testimony to his wonderful powers as a clear expositor of scientific subjects; he was perfectly at ease before the most imposing audience in discoursing on astronomy, electricity, chemistry, or mechanics. These lectures were published afterwards in our city, and we sometimes refresh our memory of the lecturer by a perusal of them. After a residence of five years in our country, he left for Europe and took up his abode in Paris, where he has almost constantly lived since, and where he contributed to several British periodicals and scientific works. He was not a very original thinker or writer, but he was a very clear and popular one. His elementary works on astronomy and the steam-engine have been the means of extending useful knowledge among the millions, and thus he has left a broad mark upon the age in which he lived.

PATENT EXTENSIONS.—During last month the following patents have been extended: Stephen R. Parkhurst, machine for ginning cotton and wool; Richard M. Hoe, printing-presses; Francis L. Hedenberg, stoves; Chas. Goodyear, manufacture of india-rubber fabrics. All the above parties reside in New York city.

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Scientific American.

NEW YORK, JUNE 4, 1859.

Special Notice.

All subscribers to the SCIENTIFIC AMERICAN who have paid the full subscription price (two dollars) for the complete volume which has heretofore terminated in September, are informed that by remitting $1 60 more, their subscriptions will be continued for one year on the New Series commencing July 1st.

CLUBS of subscribers who have paid up to September, and wish to renew their subscriptions or form new clubs at that time, can do so at the club rates, deducting 30 cents each from all the present subscribers and complying to our advertised rates on new ones; for instance, a club of 10 subscribers who have paid $15 for one year's subscription up to September, may have their subscriptions continued till the *end* of Vol. I, New Series, or one year from July 1, 1859, by remitting $12.

Science and Modern Warfare.

Science was once the handmaid of liberty, as in the days when Archimedes defended Syracuse against the Consul Marcellus for eight months, astounding the Roman soldiers with the deadly effects of his ingenious machines. Then science was local, now she is cosmopolitan; and the progress which has been made in fire-arms and the appliances of war must influence the struggle between France and Austria for the Italian nationalities.

Let us see how this is to be done, and the probable effect of improved implements of destruction as employed in modern warfare. The daily papers of our city have been indulging in pleasant fancies on the superiority of France in the matter of arms, quite ignoring the fact, either from ignorance or forgetfulness, that Austria is just as well prepared, and that she has not forgotten the motto, "In time of peace prepare for war."

It is true that the old musket has given way to the rifle, that breech-loading guns are being rapidly introduced into the armies of Europe (by which three shots to the common gun's one can be fired), that revolving carbines are furnished to some companies of light cavalry, and that many-chambered pistols have found their way into military holsters.

We are told of cannon that have deadly effect at five miles, and that a great number of light field-pieces are superseded by a few guns carrying heavy shot. The round ball has passed away before the conical one; and the names of Norton, Minie, Jacob, Colt, Sharp and Armstrong stand as shining lights amid the din of cannon and the smoke of powder.

Napoleon the Great did not understand the value of individual skill in the use of arms, the secret of his system being to pour a mass of men upon his enemy after a well-directed cannonade from the artillery had decimated their ranks and produced momentary confusion. He depended on the collective bravery of a mass of soldiery, not upon the intrinsic skill of the soldier.

A soldier in the British army was told by his officer, in 1838, that, in firing at a man 600 yards distant, he was to fire 130 feet above him; so imperfect were the arms of Europe at that period. Now, with the improved arms supplied to the army, the soldier can make far better practice at 500 yards, or even 1,000, than he could with the old musket (which achieved the peninsular victories) at 100 or 200 yards. With Gen. Jacob's short barrelled four-grooved rifle, introduced, we believe, in the East Indian service, a tolerably good shot can hit an object the size of a man, once out of three times, at a distance of 1,000 yards, the effective range being 2,000 yards. The Enfield rifle is of about equivalent value.

The French admit firing 25,000,000 cartridges in the Crimea, and they certainly did not hit 25,000 men, or one in a thousand, nor did they kill half that number by musketry fire. All this time Austria and the armies of Germany have been perfecting their munitions of war, and profiting by the failures of other nations.

But, thanks to the art of printing, each improvement, and the experiments testing its efficacy and value, quickly find their way all over the world, and the armies have progressed together and are as capable as they ever were of meeting on equal terms. And to sum up, the only changes in modern warfare, by improved means of slaughter, may be briefly stated as follows:—

Firstly, The result of a battle will depend upon the skill and practice of the soldier more than formerly, and a sure aim will effect more than the showers of bullets hitherto thrown away.

Secondly, Personal bravery will be in a measure lost, cavalry rendered of less utility, and on riflemen and artillery will depend the issue.

Thirdly, Battles will be shorter in duration and more deadly in effect.

Fourthly, That nation which has within it most skill and science, which most has cultivated the liberal arts and trained its men to that coolness which only knowledge can give, will be surest of victory; or in other words, brute force dies out and brain force at last prevails in its very lowest sphere of action.

And lastly, Wars will be more bloody and more like murder than ever, and we hope that men may soon become convinced that it is a destructive folly, and settle their quarrels, personal and national, without recourse to slaughter and bloodshed.

While, however, it is an established fact that skill in the use of arms will greatly influence the fate of battle, the nearer that fire-arms approach perfection of aim, the greatest power of propulsion and the most simple combinations of mechanism, the more will such weapons be sought by the governments of contending nations. From our inventive genius as a people, and our neutrality as a nation, we are in a peculiarly fitting position to supply them with these, and thus, though not participating in the bloodshed, we can take a share of the spoils.

Street Railroads.

To the city of New York, we believe, belongs the credit of originating the now widely-extended and still-extending system of street-railroad travel, which is strictly an American institution. About twenty years ago the Harlem Railroad Company conceived the utilitarian project of making the best use of the track which they had laid, by starting a line of small cars upon it to run from the upper part of the city, for a distance of two miles, to the City Hall, and carry passengers at the same rates as the stages. This, the first of city railroads, was eminently successful as a paying concern; still it was a long time after this before the fact of its utility made a sensible impression upon the public mind. It was not until 1852 that other lines were started, in which year the Sixth and Eighth avenue lines were laid. Much prejudice, however, had to be removed before this was accomplished. There are now six lines of street railroads in this city, which, with their double tracks, are, unitedly, about forty-five miles in length. They are great corporations in every sense of the term, for they carried during the past year no less than 27,057,000 passengers, and earned $1,352,000. These roads employ about 2,000 horses and mules to draw the cars, quite a large force of conductors, drivers, agents, &c., and are doing a very prosperous business.

For many years we advocated the multiplication of city railroads before their advantages were publicly appreciated, but truth always triumphs at last, and within the past four years street railroads have wonderfully expanded in the cities of Brooklyn, Boston and Philadelphia; and at last our Cockney friends are now earnestly proposing to adopt the system in good old London itself.

Much has been learned by the experience of New York in the construction of street railroads, and a work recently published on this subject by Alexander Easton, C. E., No. 42 Wall street, Philadelphia, contains a great amount of practical information on this subject. The grooved rail, which is the *chef d'œuvre* for street tracks, was a most important improvement. Its top being laid flush with the pavement, and the groove permitting the flange of the wheel to run in it, allows other vehicles to cross the tracks freely. The old T and tram rails never could have answered for streets; therefore we consider this invention of very great importance, because it has rendered the system a practical success. Another great improvement, to enable the cars to turn at the corners of streets, was replacing the grooved rail with a tram rail at the sharp curves, so as to raise the flange of the off wheels, and give them a greater travel according to the contracted curve. Both these advantages have been provided to hand for those cities which are now adopting street railroads with something like a rational excitement. This appears to be the case with our "Quaker City" friends of Philadelphia, who are going ahead with a commendable spirit in constructing a more perfect system of street railroads than any other city in the country. During the past year they have finished and put in operation eight lines, seventy-nine miles in length, of single track, all of which are doing a prosperous business; and ten other companies are chartered and building their lines, so that, in the language of the *North American Gazette*, "there is scarcely a portion of the more compact portion of the city that is not penetrated by one or more of these lines; in fact, as has been poetically expressed, the city is gridironed with them."

The [illegible] but our street railroads have wonderfully assisted the means of communication between the distant portions of New York, still, owing to the form of Manhattan Island, all the travel between the upper and lower districts is confined to a very few long streets, which will always make these streets crowded at certain periods of the day, let the means of carrying passengers be multiplied to any extent; and hence, also, our city, although the first to adopt street railroads, cannot extend the system in the same proportion as Philadelphia, or even Brooklyn, which has a very extended breadth in proportion to its length. Wherever city railroads can be extended and multiplied they should be adopted, as the best means of relieving overcrowded streets from omnibuses, because one horse can draw five passengers on a rail for every person that can be drawn "over the stony street" in a stage.

As street railroads have not yet found their way into any of the cities of the Old World, we would recommend their adoption, first of all, to the good people of London, for relieving their overcrowded thoroughfares. We assure them that they are an American institution well worthy of introduction as a means of accomplishing a revolution in their means of city travel, and as well adapted for the aristocratic monarchist as the most vehement republican.

Agricultural Fair Premiums.

The Morrow County, Ohio, and the Wyoming County, N. Y., Agricultural Societies have each offered as premiums a large number of yearly subscriptions to the SCIENTIFIC AMERICAN for various articles to be offered for exhibition at their next fairs. We are happy to notice this recognition of the value of our journal, and would state that other societies have before pursued this system with satisfaction to the exhibitors.

Mammoth Patent Lawsuit.

For several years past there has been a lawsuit in progress in the United States Court for the northern district of this State, which, for foggy procrastination, appears to be a disgrace, not only to the country, but to the age in which we live. The present state of this lawsuit is ably set forth in an article of considerable length in the Saratoga *County Press*, which states that the records of the case already fill three printed volumes of 500 pages each, and perhaps as many more will be required before the lawyers allow the birds to escape from the meshes of the legal net.

THE case relates to what is called "the hook-headed spike," for making which Henry Burden, of Troy, N. Y., secured a patent on a machine in 1840. It seems that in 1845 some informal agreement was made between the owners of the patent and Winslow, Corning & Co., when the latter got some of the machines made and commenced manufacturing the spikes. In 1848 the patentees sued for an infringement, but the District Court decided that the defendants were working under a license. An appeal from this decision was taken to the Supreme Court of the United States, where the decision was reversed, and a decree made in June, 1853, that the use of the machine by the defendants was an infringement of the patent, for which they must give an account for damages, profits, &c., to the plaintiffs. The case was then referred to Marcus T. Reynolds, Esq., master of the Court, to take testimony, examine persons under oath, books and papers, and to ascertain the damages, profits, &c. Mr. Reynolds declined the appointment, and the Hon. R. H. Walworth was selected in his place, who, in March, 1854, commenced taking testimony. The amount claimed by the plaintiffs is $746,164 as profits on 45,046,000 lbs. of spikes, and $4,600 for other expenses. This is a large sum of money, but our cotemporary caustically remarks: "The costs of masters, lawyers, witnesses, &c., are enormous; we cannot begin to estimate them. When the case is closed up—if ever it does get to a final decision—we think we should prefer to take the costs rather than the verdict."

From the day on which the testimony commenced to be taken until now—five years—the case, like a huge snake, has been coiling itself into complicated folds, threatening to crush out the whole profits and damages claimed. A smart merchant would have finished the business in as many months as it has been years in progress, but then this would not have sufficed to maintain the dignity involved in executing the degree of such a dignified body as that of the United States Supreme Court.

A commission, it is stated, has been sent to England to take testimony of the iron masters there—a most unnecessary act—and dealers in spikes, and workmen in nearly all parts of the country, have been called upon for testimony. Questions have been asked of witnesses which have required several days to answer, and some of these which we have read appear to be rather an effort at prolixity than precision to assist in concluding the protracted issue. It is now about eleven years since the suit was first commenced, and it still affords golden nest eggs for hatching a well-feathered brood to those who are engaged in conducting it.

Murexide Colors.

We described the beautiful purple colors obtained from preparations of uric acid, on page 181 of Vol. XIII. of the SCIENTIFIC AMERICAN. The Glasgow *Practical Mechanic's Journal* describes an improved method of dying these colors on fine woolen goods. The wool after being cleaned is boiled for an hour in an *acidulated* bath of tartaric, citric, or oxalic acid, or the muriate of tin with acid slightly in excess. After this the wool is steeped in cold murexide for about two hours when it assumes a beautiful amaranth color. To the solution a small quantity of dissolved corrosive sublimate is now added, when the wool assumes a most brilliant crimson shade.

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The Inventor of the Steam-Engine.

"Lives of great men all remind us,
We may make our lives sublime,
And departing leave behind us,
Footprints in the sands of time."

Men differ from one another in greatness as the stars do in glory. Some are brilliant as solar orbs and emits a splendor of their own; others are like planets, which exhibit a beautiful but borrowed light; while others, again, twinkle only as feeble asteroids, almost defying the powers of the telescope to recognize. Among the great shining lights that have reflected a power of their own upon this earth, James Watt, the great inventor of the steam-engine, occupies the elevated position in practical mechanics which Sir Isaac Newton does in natural philosophy. In the accomplishment of great results affecting all classes of society in multiplying the productive powers of industry and art, he stands high above all other men, as Saul stood above the tribes of Israel. Thus premising, we are led to a brief consideration of this subject by a perusal of his biography, in its abbreviated form, by Muirhead, just re-published by D. Appleton & Co., of this city, and forming a most valuable addition to our useful literature. From it we learn that this great inventor and mechanician was born in January, 1736, in Greenock, a seaport town in the west of Scotland, and being of a delicate constitution, he received most of his youthful tuition from his father and mother at their fire-side. An early display of talent for mathematics and mechanics was cultivated with assiduity, and, when quite young, he constructed various ingenious machines and instruments. During a single year's instruction in the city of London, as a philosophical instrument maker, he became as skillful a workman as several journeymen in the same shop who had been engaged at the business for ten years. After this he came to the city of Glasgow, was furnished with a shop within the College walls, and received the title of mathematical instrument maker to the University. Here his talents were early appreciated by the professors and students, especially by Dr. Black, the father of modern chemistry. It was while repairing a model of Newcommen's atmospheric engine (which was used in lecturing by one of the professors), that he invented the "separate condenser" to the engine, and thus changed its whole character and quadrupled its powers. Of all the inventions which the ingenuity of man has devised, it is the most wonderful and useful. It greatly resembles the human body in its mode of operation. The cylinder, like a great heart, receives the steam by throbbing valves, and it becomes animate with power and motion—forging a needle, spinning at silken cord, weaving a carpet, knitting a stocking, propelling the majestic steamer across the ocean, and the rolling car over the iron-bound course through forest, field and prairie. So practical and synthetical was the genius of Watt that he constructed the seam-engine and left it very nearly as perfect as we now have it, except in its adaptibility and application to railroads. It is not possible for us to estimate the value of the benefits which his inventions have conferred upon mankind; we can do but little more in our brief space than acknowledge their importance.

The old atmospheric engine, as Watt found it, was single-acting. Steam was admitted under the piston into the cylinder, then cut off, and a jet of water then condensed it, when the piston descended; then the water was let out, steam again admitted, and so on continuously, wasting an immense amount of time and heat.

The manner in which his invention originated was pecular. The model of the atmospheric engine which he was employed to repair having greatly excited his mind, he examined it thoroughly, and soon comprehended its entire principle of action. He became satisfied that it was radically defective in some points; that it wasted an immense quantity of heat, and that it could not be made to operate rapidly by any arrangement whatever, owing to the successive heating and cooling operations in the cylinder at every stroke. Occupied with such thoughts he took a walk out into the green fields, and during his meditations, the idea of condensing the steam in a separate vacuum vessel flashed across his imagination like a gleam of lightning. Almost as soon as this thought entered his mind he mentally arranged mechanical devices to test it, and by next day at noon he had a rude model constructed, and proved the value and correctness of his grand conception. After securing a patent, he found it very difficult to get a person of sufficient wealth and enterprise to engage in building large engines. This, however, he at last fortunately secured in Mr. Bolton, a wealthy Birmingham manufacturer. The first engines they built were for pumping the deep mines of Cornwall, and they were sold under the most favorable and honorable conditions; the tax asked for their use being one-third of the price of the fuel which they saved annually. After their value and usefulness had been established there were several parties who were mean enough (even when making fortunes by their use) to try and cheat him out of his rights, just as there are parties who try to cheat inventors at the present day. On this account he was involved in several lawsuits, and on one occasion had to pay $30,000 for London lawyers' fees alone. This he considered a great extortion, but he bore

BARON VON HUMBOLDT.

it with considerable fortitude; and we advise those interested in the celebrated "Hook-headed Spike Case" (now eleven years before our United States courts) to exercise, in their weary pilgrimage through the winding avenues of legal prosody, the same spirit.

It affords us pleasure to state that the last days of this great inventor were spent in comparative wealth and tranquility of mind. Long after he retired from business, he kept on inventing for his amusement; and he used his tools, bench, workshop and leather apron to the very last month of his life. At 80 years of age he invented a machine for copying busts, and his first production in this line he presented to a friend, remarking, with his usual quiet humor, "by a young engraver in his eighty-second year." He was also the inventor of the copying-press, an invention now universally used. He could construct a telescope, a parallel ruler, an organ, a violin, a clock, a bridge, and a steam-engine with equal facility. He was undoubtedly the greatest mechanic that ever lived, and his knowledge on all subjects was wonderful. He could speak and write French, German and Italian; he understood music, chemistry, anatomy and geometry, in short, he was a prodigy; yet he was a most modest, honest and kind-hearted man. He was offered a baronetcy by the king, but he refused the honor—it could not add to his fame or character. He did more for the world than all the generals and statesmen that ever lived; and although several monuments have been erected to his memory since his death, which occurred on the 19th of August, 1819, yet he needed them not. Wherever we see a steam-engine, there is a monument to JAMES WATT.

Inventor of Friction Matches.

If we would estimate the greatness of an invention by its usefulness, the discovery of friction matches was certainly one of the greatest of modern times. According to recent English papers, the inventor of friction matches was John Walker, a chemist of Stockton, England, who died on the 5th of last month at the advanced age of 79 years. He made the discovery nearly half a century ago while experimenting with various chemical substances, and for a number of years he realized a handsome income from the sale of matches at the price of about 36 cents a box, which was no larger than those now sold for one cent each. The first patent obtained in America for friction matches was by Alonzo Phillips, of Springfield, Mass., in Oct. 1836. It was only claimed as an improvement, and not an orignal discovery.

We see by an advertisement in our columns that photographs of the Corliss engine are for sale. This is a good idea, as so many persons want to know what they are like, and cannot make a journey to see one.

Correspondents

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

D. P. F., of ——. We think a patent can be obtained for your invention. A model of a wheel showing the arrangement of the two plates will be required for the Patent Office. You failed to inform us where you reside, therefore we could not write you.

G. A. R., of Pa.—Picture frames are gilded by being first covered with parchment size and the gold leaf laid and burnished with a suitable tool.

J. E., of Ohio.—You will find in "Phillips' Metallurgy" a full account of the process of smelting silver: it would take up too much of our space to give you all the necessary instructions. The book may be procured from H. Balliere, bookseller, of this city.

G. W. G., of Miss.—Your plan for a perpetual motion is principally like all others in one respect, and that is it will not go.

J. L. T., of Conn.—For obtaining a knowledge of elementary chemistry, we strongly recommend you to procure Wells' Principles of Chemistry, published last year by Ivison & Phinney, of New York. It is the latest and best work out, and contains much that you will not find in the older treatises.

J. M. D., of Va.—The hands of watches are stained red by a lacquer made of common lac-varnish colored with carmine. You can easily make some of it and test the matter for your own satisfaction. This color soon wears off, and its application to watch-hands is not commendable.

E. H. A., of Ill.—Soap suds containing some diluted tobacco juice is an excellent wash for destroying bark lice on apple trees; apply it with a tin-pail, which has a perforated spout.

J. W. J., of Fla.—There is no published work which treats of painting, graining, mixing of colors, and the staining of wood to imitate mahogany, rosewood &c.

F. L., Jr., of Pa.—We answered your former letter by mail several days ago. Inquire at the Post-Office.

S. B., of La.—A siphon cannot be made to discharge above the line of its shortest end. No improvement has been made on such instruments, so far as we know, during the past twenty years.

J. M., of Ind.—Map varnish is made by dissolving Canadian balsam in rectified spirits of turpentine, but you can purchase such varnish cheaper than you can make it of persons who supply painters materials. Gum mastic and pale seed-lac dissolved in alcohol make a good varnish also.

J. C., of New York.—Gum arabic is unsuitable to mix with gum-resins, such as lac and copal, in making varnish. "French polish" is a varnish made by dissolving pale shellac 5 lbs., gum mastic 7 oz., in about six pints of alcohol. Dissolve the gums cold, and stir them frequently until the solution is complete.

D. S., of Phila.—A spiral wheel fitted into a frame of a balloon and capable of being turned by hand to assist the æronaut in ascending and descending, has been tried by Capt. Taggart, of Lowell, who made several ascents, and operated it with tolerable success.

G. H. G., of N. H.—Smee's Electro-Metallurgy, published by J. Wiley, this city, contains the information you want on electro-plating.

J. B., of Boston.—We understand that the decomposition of nine grains of water 108 grains of silver will be deposited from 134 of the cyanide; that is according to their chemical equivalents. The articles you refer to on electrotyping were published in Vol. VI. of the SCIENTIFIC AMERICAN.

B. H. & Co.—There will always be a diversity of opinion about the rate of speed at which saws should be run, because the speed depends on the kind of wood to be cut, and the order in which the saws are kept.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, May 28, 1859:—

A. P., of Wis., $37: N. H., of N. Y., $30; W. H., of Ga., $30; J. P., of N. Y., $30; P. & B., of Iowa, $20; J. W. N., of Ct., $10; D. A. W., of Ga., $30; S. V. R. N., of N. Y., $25; W. W. L., of O., $250; J. A., of N. Y., $25; J. F. S., of Mass, $25; D. B. R., of Ill., $25; J. W. N., of Russia, $100; L. B. J., of Mass., $30; W. H. B., of Iowa, $25; C. & B., of Ct., $30; A. G. M., of N. Y., $50; R. W. C., of N. Y., $25; J. P. P., of N. Y., $30; D. E. B., of N. Y., $25; E. A. T., of N. Y., $25; J. W. S., of Me., $25; J. W., of Va., $55; H. & G., of Pa., $40; S. A., of S. C., $55; J. C. S., of Mass., $275; F. C. S., of N. Y., $30; E. H. A., of Ala., $25; W. P. V., of Me., $40; P. J. C., of Ct., $15; T. M., of N. Y., $25; E. O., of Mass., $30; W. & S., of Cal., $50; H. D., of Pa., $30; D. A., of Mo., $25; H. K. S., of Mass., $25; J. G., of Pa., $25; G. A. T., of Pa., $55; H. & H., of Mich., $12; H. S., of O., $15; E. B., of Pa., $25; H. & K., of Mass., $57; O. P., of N. Y., $30; T. & B., of O., $30; T. C., of Pa., $30; A. B., of Ala., $55; A. M., of Ind., $27; N. & M., of Ill., $30; W. G., of Mass., $25; T. & C., of Ind., $30, N. B., of N. Y., $30; J. P. of Cal., $25; C. P. B., of O., $30; C. T. P., of N. Y., $100; B & B., of Ind., $30; W. S. H., of N. Y., $25; J. H. of N. Y., $35; C. T. P., of N. Y., $50.

Specifications drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 28, 1859:—

P. & B. of Iowa; M. B. of Ill; J. A. of N. Y.; D. K. of Va.; J. K. L. of O. T.; W. S. H. of N. Y.; C. T. B. of N. Y.; A. T. U. of N. Y.; A. P. of Wis.; J. C. G. of Cal.; T. M. of N. Y.; S. K. W. of R. I; S. A. of S. C.: E. A. T. of N. Y.; E. B. of Pa.; A. M. of Ind.; S. V. R. N. of N. Y.; W. H. B. of Iowa; R. W. C. of N. Y.; J. W. S. of Me.; M. B. of N. H.; J. F. S. of Mass.; H. K. S. of Mass.; C. P. B. of O.; J. P. of Cal.

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[Concluded from page 323.]

CIRCULAR CLAMPS FOR SEWING MACHINES—Stephen G. Tyler, (assignor to himself, G. J. Saage and J. W. Barnum,) of Quincy, Ill.: I claim the combination of a central disk, e, with the convex clamping disk, d, and the flat sustaining disk, f, substantially in the manner described, for the purpose of dividing the crown and quarters of circular sewing and presenting the edge of the fabric to the needle, in the manner set forth.

RE-ISSUES.

MANUFACTURE OF INDIA-RUBBER GOODS BY MEANS OF ZINC COMPOUNDS—Horace H. Day, of New York City, assignee of Henry G. Tyer and George Helm, of New Brunswick, N. J. Patented Jan. 30, 1849; Reissued Aug 7, 1849: I claim india-rubber fabrics made by the combination of caoutchouc, in its several varieties, with the sulphuret of zinc, or the bi-sulphuret of zinc, or the hyposulphite of zinc, or the sulphite of zinc, and also with zinc compounds in their several forms, as set forth, and sulphur, and in combination with these in either case, the submitting said compound to the action of steam at a high temperature, the whole being combined and manufactured substantially as described.

APPARATUS FOR RAISING WATER—Wm. T. Barnes, of Buffalo, N. Y. Patented March 20, 1849: 1 claim, first, The combination of a casing whose sides slope outward from the induction opening with a revolving piston, the edge of whose blades conform to, and run near to the sloping sides of the casing or the spiral rib, substantially as described for the purpose set forth.

Second, In combination with a casing whose sides slope outward from the eduction openings, I claim a rotating piston, with fixed blades, inclined upon the face to the axis of the piston rod, for the purpose set forth.

Third, Dividing the stream of liquid as it enters the casing containing the rotating piston by causing it to pass through two or more induction openings, arranged substantially as described, so that the blades of the piston pass over these openings.

INKSTANDS—Thos. Robjohn, of New York City. Patented Aug. 25, 1857: I claim, first, The arrangement for flexing the elastic diaphragm by attaching a mechanism in connection with the cover for the ink cup, that the opening and closing thereof shall effect the raising or discharge of the ink or other fluid into or from said cup, as specified.

Second, The cover arranged and operating, as above set forth, in combination with the elastic or flexible diaphragm and a non-corrosive fountain or ink cup, when operating as and for the purposes specified.

Third, The combination and arrangement of cam-lever, d, and plunger, l, or the equivalents thereof, for effecting the raising or discharge of the ink by raising or closing the cover of the non-corrosive fountain cup, substantially as specified.

Fourth, Arranging the cam centers in such relation to each other that, by raising the cover, the requisite depression of the diaphragm will be produced to obtain the required result, as specified.

[An engraving and description of this simple, cleanly and efficient inkstand was published on page 160, Vol. XIII., of the SCIENTIFIC AMERICAN.]

ADDITIONAL IMPROVEMENT.

BOW WHIFFLE TREES—Freedom Monroe, of Romeo, Mich. Patented Aug. 26, 1858: I claim the bearing bar, the chain and braces attached thereto, and the paddled swivel joint, to be used in combination with my improvement in harness disclaiming the original invention heretofore patented.

DESIGN.

SEPULCHRAL MONUMENTS—Richard Barry, of Boston, Mass.

NOTE.—Two weeks ago we stated that probably there was never so many patents granted to the clients of a single agent before, in one week, as was granted to our's in that. But in this week's list the number, we are gratified to find, is the same; thus making SIXTY-FOUR patents issued, in two weeks, to persons who had their papers prepared and business conducted at the home office of the SCIENTIFIC AMERICAN.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 37 Park Row, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

MESSRS. MUNN & CO.—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant.

J. HOLT.

Communications and remittances should be addressed to MUNN & COMPANY, No. 37 Park-row, New York.

THE ART OF HANDRAILING ILLUSTRATED and Simplified—By H. C. COEN, Architect and Builder, deceased.—A simple and accurate method of obtaining the face-mold, and its application shown, with lines laid down in a clear and plain manner, capable of being understood by any practical workman. The advantages claimed by this system are these:—first, having less lines than any work yet published; the face-mold struck with compasses; wreaths cut square through, and joints made at once, at right angles with the surface of the plank; no falling-mold necessary, and a saving in material and labor of at least 50 per cent. By mail free. Price, $5. Address FRANKLIN COEN, box 411, Wheeling, Va. 1*

A RARE CHANCE—FOR SALE, AT A GREAT bargain, part or the whole of the Gravel Foundry and Machine Shop, Kenosha, Wis., together with the sole right for the States of Wisconsin and Illinois, to manufacture N. Leonard's Patent Seamless Thimble Skeins for Wagons, the most saleable skeins in the world. Part cash and part other property. For full particulars address J. COUNCILLOR, Esq., Rahway, N. J., or the proprietors. LANGE & DOYLE, 39 4* Kenosha, Wis.

PHOTOGRAPHY—COMPLETE APPARATUS for $25, all of the best make, sent with instructions for use (the process is very simple) to any address. Invaluable to inventors, engineers, and others, in copying drawings, models, &c. C. J. FOX, 681 Broadway, New York. 39 2*

PATTERN AND MODEL MAKING—BY J. MURRAY, No. 220 Center street, near Grand, New York. 1*

WHEELER & WILSON'S SEWING MACHINES—Office, No. 505 Broadway, New York. "They are without a rival."—Scientific American. Send for a circular. 39 4

INSTRUMENTS—CATALOGUE CONTAINING 250 illustrations of Mathematical, Optical and Philosophical Instruments, with attachment of a large sheet representing the Swiss instruments in their actual size and shape, will be delivered, on application, to all parts of the United States, by sending 12 cents in postage stamps. C. T. AMSLER, No. 635 Chestnut st., Philadelphia.

☞ Catalogue of Stereoscopic Pictures is furnished gratis on application. 39 6eow*

THE COMMITTEE ON WATER WORKS of the City of Philadelphia are about to erect two additional Turbines at Fairmount Works. They have directed that a test of the comparative value of the different wheels be made by models, at their works, commencing June 7. For further information address H. P. M. BIRKINBINE, Chief Engineer, Water Department, Philadelphia, Pa. 1*

5000 AGENTS WANTED—TO SELL FOUR new inventions. Agents have made over $25,000 on one—better than all other similar agencies. Send four stamps and get 80 pages particulars, gratis. 39 13* EPHRAIM BROWN, Lowell, Mass.

1000 AGENTS WANTED—FOR PARTICULARS send stamp. C. P. WHITTEN, Lowell, Mass. 39 13*

FOR SALE—ENGINE, 20 HORSE, 10¾ CYLINder, 24 inches stroke, with flue boiler. Price, $600. One Jas. A. Woodbury first class iron frame double surfacing Tongueing and Grooving Machine. Cost $1,500 one year ago; will sell for $1,000. Apply to H. ASHCROFT & CO., Washington Village, South Boston, Mass. 1*

WANTED—ESTIMATES FOR RICE HULLING and Cleaning Machinery capable of cleaning 180 bushels per day—that is, in ten hours, with a full description of the machines and their operations. The pestle and mortar is preferred to remove the inner coating of the berry. Address A. B. HENDRYK, Globe Iron Works, West Thirty-third street, New York. 1*

FOR SALE—THE IRON FOUNDRY AND AGricultural Implement Manufactory at Knoxville, Tenn.—This establishment is admirably located for carrying on an extensive and lucrative business, and is now offered at a low price and upon advantageous terms. This establishment has been in operation several years, and controls the business of a very large district of country, being located at the terminus of two railroads, said roads branching off into one of the richest agricultural and mining regions in the Union, and having superior water communication for the transit of materials, and yearly making great developments. This is a rare chance for an enterprising party. The ore is at hand, at a low figure, and an active home market for all the articles manufactured, and at the highest market price. The great advantages enjoyed by this establishment cannot be too highly extolled, and a proper party would not fail to make very great profits. Apply to HOYT BROS, 28 and 30 Spruce street, New York. 1*

HARRISON'S 20 AND 30 INCH GRAIN Mills constantly on hand. Address New Haven Manufacturing Co., New Haven, Conn. 27 13

WHITMAN'S TURBINE WIND WHEEL.—Territorial or shop rights for sale. For particulars, inquire of the inventor, E. WHITMAN, at South Abington, Mass. 32 12*

RIVETS.—EVERY DESCRIPTION OF RIVETS: Boiler, Tank, Safe, Belt, Hose Shoe, and Tinman's, black and tinned, constantly on hand. Socket bolts of any size furnished on short notice. 38 13* TABER & GRINNELL, New Bedford, Mass.

SPLENDID PHOTOGRAPHS OF THE celebrated Corliss Steam Engine have just been taken, and will be mailed to any part of the country on the receipt of 75 cents in postage stamps, by addressing WM. A. HARRIS, care of Corliss Steam Engine Co., Providence, R. I. 37 3*

A FIRST-CLASS PATTERN-MAKER OF long experience in the business, and having a knowledge of practical drawing, is desirous to obtain good and permanent employment, either to work at the bench or take charge of a shop; is competent, if necessary, to assist in drawing. For references, address J. H., Providence, R. I. 38 3*

BANCA TIN, INGOT COPPER, SPELTER, Lead, Antimony, Babbitt Metal, &c., Mount Hope Cut Nails, Ames' Shovels and Spades, for sale by JOHN W. QUINCY & CO., 98 William street, New York. 14 13e5w*

MACHINERY.—S. C. HILLS, NO. 12 PLATT street, New York, dealer in Steam Engines, Boilers, Planers, Lathes, Chucks, Drills, Pumps; Morising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 28 e3w

GAGE COCKS, OIL CUPS, GAS COCKS, Steam Gages, Globe, Angle and Governor Valves, Flange Cocks, Pumps, &c., manufactured and for sale by HAYDEN, SANDERS & CO., No. 306 Pearl st., New York. 16 13eow*

A SUBSTITUTE FOR LEAD PIPE.—A New and Valuable Article, viz., a Semi-Elastic Pipe or Hose which can be used with pumps of any kind, for suction, forcing, or conducting water in any and every place where pipe is required. Its properties are:—It imparts no deleterious effects to the water, nor in any way effects it unpleasantly after a few days' use; it is sufficiently elastic to be bent into curves, and it is unaffected by heat or cold: it will not burst if water is frozen into it; it is not injured by exposure to the sun or atmosphere; it is composed of ingredients indestructible, except by fire. Samples of it have been tested by use for three years, without the least apparent decay, and it can be made to bear pressure as high as 4000 lbs. to the square inch. Price not far from that of lead pipe. Circulars with prices and particulars furnished by the manufacturers. BOSTON BELTING COMPANY, corner of Summer and Chauncey streets, Boston, Mass. 31-13*

FOUNDRY AND MACHINE SHOP FOR SALE AT AUCTION.—I will sell to the highest bidder, on the 15th of June, 1859, commencing at 10 o'clock, the Ground and Brick Buildings, consisting of Foundry, Machine Shop, Blacksmith Shop, Brass Foundry and Pattern Shop, situated on the south side of Monroe st., between Eleventh and Twelfth streets, Louisville, Ky. The foundry has 3,500 feet molding floor; blacksmith shop has six forges and a fine lot of tools; finishing shop has about 12,000 square feet of room, with boiler and two engines to drive machinery, one for fan.

1 large Horizontal Boring Mill, for cylinders.
2 Upright Boring Mills, turn 6½ and 8 feet.
1 Double-Headed Lathe, 36 feet bed; swings 40 inches.
1 " " 21 " " 33 "
7 Small Lathes; turn from 3 to 12 feet.
1 Planer 12 feet by 3 feet square.
1 Compound Planer, with circular attachment.
3 Wood-Turning Lathes.
3 Drill Presses, 1 Gear Cutter, 1 Bolt Cutter, Vises, and a fine assortment of small tools to expedite work.

Terms of sale will be for the buildings and ground (which will be sold without any of the machinery), $7000 in one, two, three, four and five years, and the excess upon six and eighteen months, with lien and approved security upon the first four payments. The machinery and tools will be sold in detail: all sums of $50 and under, cash; from $50 to $500, six months; $500 to $1000, six and twelve months; and over $1000, six, twelve and eighteen months, with approved security payable in bank. All deferred payment to bear interest from date. E. A. GARDNER, Assignee of Lawson & Pearce.

N. B.—The above buildings are admirably suited for an Agricultural Implement Manufactory, Planing Mill, Furniture or Tobacco Factory, Brewery, and for many other branches of manufactures. 38 2*

TO INVENTORS AND PATENTEES.—A. B. ELY, Counsellor-at-Law, Traveler Building, Boston, Mass., will give his personal attention and experience of fifteen years to consultations and trials in all matters relating to the law of patents, interferences, infringements, &c. 38 13*

MARINE RAILWAYS.—THE SUBSCRIBER, Marine and Naval Architect, is prepared to build Marine Railways and Dry Docks, and to furnish Steam and Horse-power Engines, Chains, Castings, &c., on short notice and on reasonable terms. Satisfactory reference given. Address H. L. CRANDALL, New Bedford, Mass. 38 13*

THE SCIENTIFIC AMERICAN SIGNS, for Munn & Co., were painted by Ackerman & Miller. Refer to the Commercial Agency, McKillop & Wood, Park Buildings. All communications for signs, banners, or other ornamental work, attended to with dispatch. ACKERMAN & MILLER, 101 Nassau st., next to the New York Herald Office. 27 3m*

SUN DIALS—MANUFACTURED BY W. W. WILSON, Pittsburgh, Pa., of new and highly improved patterns of every latitude; a suitable cast column is furnished with them. Every garden, lawn and plantation should have one, being ornamental, accurate and useful. Address the maker for circular of prices, description, &c. 33 3*

WARTH'S SELF-ACTING WOOD-TURNING LATHES.—The best and most practical now in use; one boy will accomplish the work of four men. State and County rights for sale. Address A. WARTH, care W. H. Bertling, 28 Chambers st., New York, or the manufacturers, who have machines of all sizes on hand. Also a general assortment of machinists' tools. Circulars sent. Address CARPENTER & PLASS, 479 First ave., New York. 37 3*

CROZIER'S PATENT BARREL MACHINERY—Five hundred barrels can be made in a day by one set of machines. For machines or rights for State or county, apply to PETER WELCH, Oswego, N.Y., or to the agents, SLIPPER & GOADBY, No. 2 Broadway, New York. 37 4*

WELLS' PATENT IMPROVED CIRCULar Saw Mills, acknowledged the best in use. Also, Portable and Stationary Steam-Engines of superior excellence; Water Wheels, Mill Gearing, &c. Address H. WELLS & CO., at their old stand, Florence, Hampshire county, Mass. 35 6*

CROSSETT'S PATENT STAVE CUTTER—Patented July 1, 1844: re-issued March 2, 1858; renewed and extended June 26, 1858.—The above mentioned machine is warranted to cut more and better staves than any other machine in the United States, and is the most simple, cheap, and durable. I hereby caution all persons against using and vending said machine (the main features of which consist in the stationary knife and vibratory bed-piece) without the legal right to do so. Offenders will be dealt with according to law. All persons wishing an interest in the extended term of said patent can obtain it by addressing the undersigned at Joliet, Ill. 38 6c GEO. I. CROSSETT, Assignee.

WROUGHT IRON PIPE FROM ⅛ OF AN inch to six inches bore; Galvanized Iron Pipe (a substitute for lead), Steam Whistles, Stop Valves and Cocks, and a great variety of fittings and fixtures for steam, gas, and water, sold at wholesale and retail. Store and Manufactory 76 John, and 29, 31 and 33 Platt st., New York. JAMES O. MORSE & CO. 31 13

GUILD & GARRISON'S STEAM PUMPS for all kinds of independent steam pumping, for sale at 55 and 57 First street, Williamsburgh, L. I., and 74 Beekman street, New York. 32 6m GUILD, GARRISON & CO.

WOODWORTH PLANERS—IRON FRAMES to plane 18 to 24 inches wide—at $90 to $116. For sale by S. C. HILLS, 12 Platt street New York. 27 tf

WARREN'S TURBINE WATER WHEEL—Improved and patented by A. Warren and E. Damon, Jr. The vast number of these wheels now in operation, and the invariable success attendidg them, is the best evideuce of their advantages over ordinary wheels in the economy of water power. The American Water Wheel Co. will send to applicants (enclosing two stamps) their pamphlet, containing engravings of turbines and a treatise on hydraulics. Address, A. WARREN, Agent, No. 31 Exchange st., Boston Mass. 32 9t*

CORLISS' PATENT STEAM ENGINES—On application, pamphlets will be sent by mail containing statements from responsible manufacturing companies where these engines have been furnished, for the saving of fuel, in periods varying from 2½ to 5 years. (The "James' Steam Mills," Newburyport, Mass., paid $19,734 22, as the amount saved in fuel during five years. The cash price for the new engine and boilers was but $10,500.) These engines give a perfectly uniform motion under all possible variations of resistance. Two hundred and fifty, varying from about 20 to 500-horse power, are now in operation. Boilers, shafting, and gearing.

CORLISS STEAM ENGINE CO., 15 26* Providence, R. I.

BOILER FLUES FROM 1 ¼ INCH TO SEVEN inches outside diameter, cut to any length desired, promptly furnished by JAMES O. MORSE & CO., 76 John st., New York. 31 13

PATENT COMPOSITION BELTS—PATENT PACKING—The Company have on hand and are ready to supply all orders for their superior Composition Machine Belting. They are proof against cold, heat, oil, water, gases, or friction, and are superior to leather in durability, and much cheaper in cost. The composition gives to these belts uniform durability and great strength, causing them to hug the pulley so perfectly that they do more work than any other belts of the same inches. The severest tests and constant use in all sorts of places during the last 14 months has proved their superiority, and enables the Company to fully guarantee every belt purchased from them. Manufacturers and mechanics are invited to call, examine, and test these belts. The Patent Packing for planed joints is in every way superior to any other article ever used for that purpose. A liberal discount allowed to the trade. "New York and Northampton Belting and Hose Co.," E. A. STERN, Treasurer, 217 Fulton st., New York. 30 13

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in the underside of the revolving plate, I, which actuates the inner end of the looping needles, and pushes them in and out alternately, to throw off made loops in rows and form new ones. There are two sets of needles, one vertical and the other horizontal, and one thread feeds them both, from the spool, F, passing over guide, G, through the cone eye, H, thence into another eye in traveler, N, which, as it revolves, feeds it on to the needles, the one set working alternately between the other and making the ribs. A cam-groove in the cone, K, moves the vertical needles up and down alternately. E is a stationary ring-plate on the machine. L is a tension-bar which keeps the needles firm, and v opens any latch of a needle which, from any cause, may have been kept closed, so that devices are arranged to meet every contingency that may arise in the operation. A needle can be put in or taken out of the conical hub, K, at any moment by removing a key, X; the same facilities are furnished for removing and adjusting the horizontal needles in plate, I. The *throw* of the needles, to make long or short stitches, can be changed by turning a screw, R. As each hooked needle has a revolving latch on its end, when the thread is laid in a hook the latch closes, the hook is drawn in, then thrust out again, when the latch opens, permitting the loop to pass up on the needle-shank, then another thread is laid on the hook of the needle, the latch closes, is drawn in again, and the loop formed on the needle is pushed off and over its point, forming part of the knit fabric, and so on, each needle doing its part in the circle. The two series of needles work harmoniously together, producing a continuous web, S, of ribbed fabric. Any girl of ordinary ability is capable of tending with ease ten of these machines, making about 70 dozen pairs of fine ribbed hosiery per day—each loom using but a single thread, and the total making 108,000,000 loops per diem. The circular ribbed tubular fabric, after being taken from this machine, is cut into proper lengths for stockings, which are footed on the machine represented by figure 2, which we will now describe.

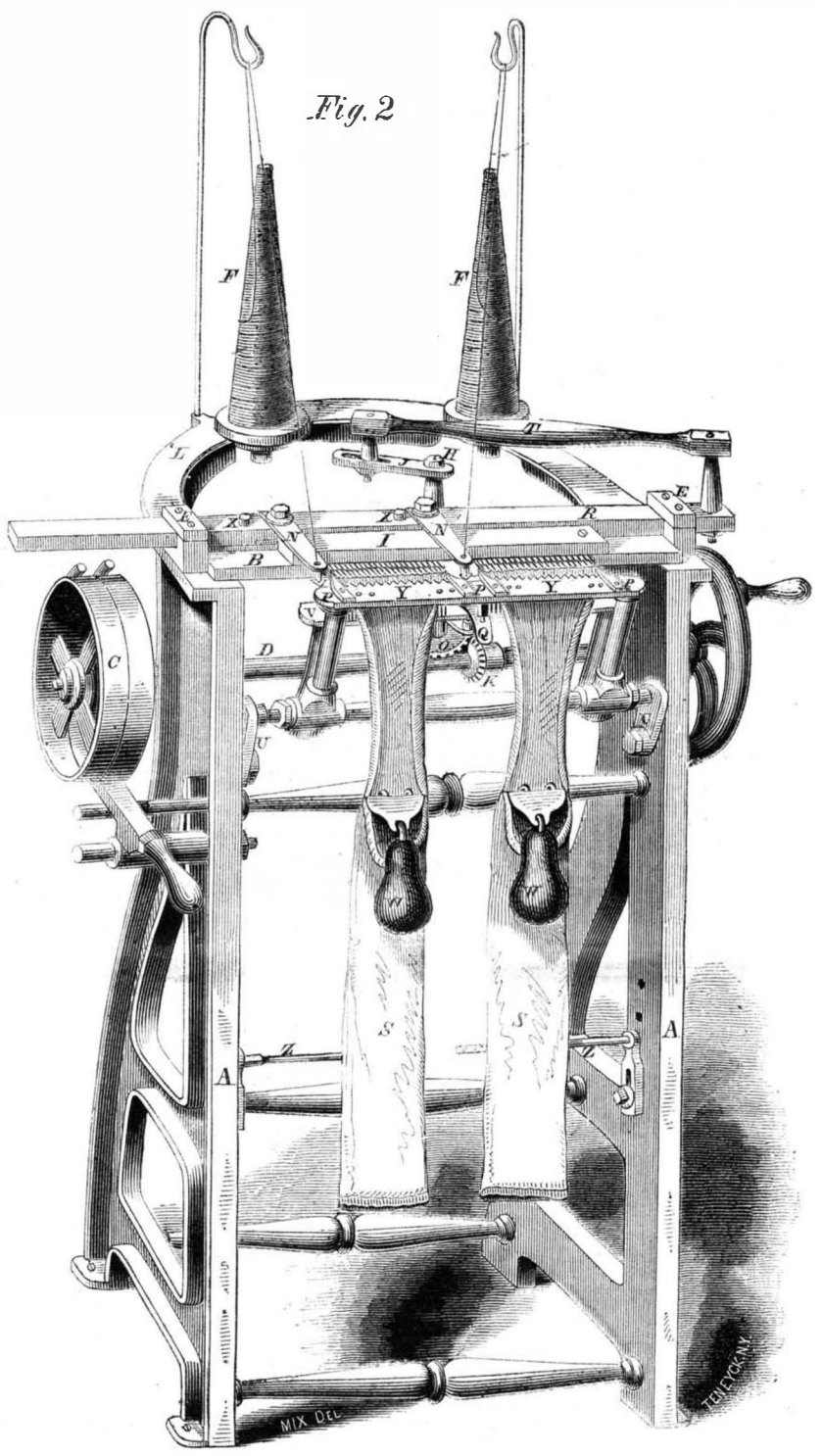
This machine knits plain work with one set of needles, and makes a common web with a selvage at each side. A represents the frame-work to which the operative part of the machine is attached. B is the needle-plate in which the needles slide; C is the driving pulley, and D the main shaft. R is a reciprocating bar for operating the needles. On the middle of shaft D is a pinion, K, fitting into one, O, on the vertical stud, H, which has a slotted crank, J, attached by a pin to the vibrating rod, T, and is secured by a pin to the bar, R, that moves back and forth operating the needles, and also carrying the two threads from the spools, F, on frame, L, through the eyes on carriers, N N, and delivering them on the needles to form two loops for the footing of a pair of stockings at one operation. Y is a toothed bar for keeping the fabric in its proper position while being knit. This bar swings upon pivots, U U, and is brought forward by pressing the spring, Q, downward, and when down a new stocking is put on, or one that is footed taken off. The weights, W W, feed off the knit fabric as in figure 1. Z Z are gages for setting the length of a foot to be knit. E E E are guide-bars, under which the reciprocating bar, R, moves. P P P are selvage guides, by which the threads from the spools are, at every stroke, guided over the needles, making a perfectly true selvage without a failure. By the screw, X, the throw of the needles can also be increased or diminished. The loops are formed by latch-needles in this machine, in the same manner as in figure 1.

It will be understood that the feet of these hose are closed at the sides by hand, but this is an easy and short operation. One of the machines (Fig. 1) can fit on a stand like a sewing machine, and may be operated in the same manner; and from their portability and completeness, it appears to us, that in their present state they must soon occupy a position in families equal to the sewing machine.

One girl can tend two of these represented by figure 2, and foot 30 dozen pairs of fine hose per day. The machine illustrated by figure 1 is the invention of J. B. Aiken, and the one by figure 2 that of W. Aiken. The circular-ribbed machines can be used to advantage on various kinds of work, without the aid of the footing one figure 2. J. B. Aiken manufactures circular-ribbed and plain knitting machines of all sizes and gages, from one which knits the smallest misses' stocking up to one which makes a heavy knit jacket. Patents for these machines have been applied for, through the Agency of this office, in foreign countries, and further information concerning their price, &c., may be obtained by addressing J. B. Aiken, No. 84 Elm-street, Merchants' Exchange, Manchester, N. H., where they may be seen at all times in operation.

AIKEN'S KNITTING MACHINE.

Fig. 2



Barking and Renovating Trees.

The *Gardener's* (London) *Chronicle* says:—"The system of stripping the bark off the trunks of trees, for the purpose of destroying the insects which infest them, has now been generally applied to a large number in the Champs Elysees, and elsewhere in Paris, and has led to the discovery of a curious but important fact. It appears that trees may be deprived of the whole of their bark, not only without experiencing any injury, but even with considerable advantage, the operation tending to increase their power of vegetation. Elms, for example, which, before the operation, did not increase more than one or two millimetres in diameter in each year, have been found to increase four or five when stripped of their bark. Trees having a very thin bark, such as the birch and others, need not be stripped to obtain a similar result; it is sufficient for the purpose to make longitudinal incisions in the bark by means of a kind of three-bladed scarificator. It is now intended to subject all the young elms in a languishing state to this treatment throughout Paris, it having answered perfectly with those planted on the fortifications. It has long been the practice where trees have been denuded of their bark by cattle, to coat them over with some kind of composition, and in most cases the result has been highly satisfactory."—[As we have seen this paragraph copied into other papers we would state that we understand it to mean, not the removal of the entire bark to the wood of the trunk, but the outside rough bark, leaving the under cuticle unbroken. As the sap of trees flows between the outer bark and the wood of the trunk, the removal of the entire bark would be fatal to their life.—EDS.

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